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Industrial Arts in the Senior High School

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THE marvelous progress which man has made during the past century and a half has not only revolutionized industrial life, but also has completely changed educational methods and philosophy. The educational theorists and philosophers have never been in entire agreement as to the purposes or objectives of education, and they do not agree at present. As long as there is a difference in opinion as to the basic purposes of education in general, we cannot expect a unanimity of agreement as to the place of the industrial arts in the schools.

Great changes in the relative proportions of the pupils in school to the total population of the United States have come about. There was a tenfold increase[1] in the secondary-school population between 1890 and 1926. This marvelous increase brought into the high schools pupils of widely varying heredity, aptitudes, capacities, and ideals of life. Compulsory education and practical-arts courses have been factors in bringing about this increase, and the school now has the further responsibility of not neglecting the educational and vocational needs of pupils who enter the high school but drop out before graduation.

Function of the Junior High School

The function of the junior high school is somewhat different from that of the senior high school; and, as it gives the fundamental training for entrance into the senior high school, it seems wise that we make a statement as to its function in order to have a starting point for establishing the function of the more advanced work in the senior high school.

In the junior high school the pupil should have a *variety of experiences* in order that he may explore, and if possible, discover his own talents, bents, or aptitudes and through his experiences finally establish at least a provisional goal for his life's activity. The subjects which are chosen in this type of school may be partly prevocational and should especially emphasize the appreciational. Part of the courses should be *tryout* courses which will help the pupil to discover himself and to explore the fields of knowledge and industry.

Function of the Senior High School

In the high school each pupil should follow a curriculum which emphasizes training ***in his chosen field*** and which meets his personal needs. The avocational interests of each pupil should also be recognized through elective studies whenever it is possible to do so.

The courses in the senior high school should be organized into curriculums which may be academic, agricultural, commercial, industrial, fine arts, home economics, etc. These curriculums, however, should all have some studies that are constants, while the others are variable or electives. In large senior high schools, special part-time classes should be provided for children of high-school age who have entered industry, whenever such classes are practicable.

The senior-high-school industrial-arts courses should emphasize industrial information and intelligence and give a specialized training that will develop *all-round* craftsmen.

The functions of the junior and senior high schools being different, it follows that the industrial-arts work in the two schools should have corresponding variations. The junior-high-school industrial-arts courses should give training in the fundamental jobs and processes that every person should know, and they should aid the pupil in discovering himself. The senior-high-school industrial-arts courses should be educational and require thinking, but they also should provide specialization which give the student real industrial experiences of the *all-round* craftsman type in one or more of the most typical vocational fields.

Types of Senior-High-School Courses That are Needed

High schools that are large enough should offer at least the following four types of courses:

1. Social efficiency courses for citizenship — college entrance not being considered. Such courses should be planned for over-age pupils and others of the non-school-loving type. They should be planned fundamen-

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[1]The per cent of pupils enrolled in the public high schools increased from 1.6 in 1890 to 15.2 in 1926, as shown by *Bulletin No. 12*, 1928, p. 2, Office of Education.

tally for pupils who are compelled to go to school and should be made as useful as possible.

2. Appreciation and technical-information courses for nontechnical high-school pupils who expect to go to a classical college, a university, or a normal school.

3. Preparatory technical and practical-science courses for pupils expecting to enter a college of science or a technical school.

4. Craft courses of a vocational nature for pupils who expect to enter industry directly from high school. In these courses helpful manipulative work and related information should both be stressed.

Changes in Industrial-Arts Objectives

If all the claims that were made for industrial arts in the early days were listed, modern educators would declare some of them absurd, partly because they were based on the theory of formal discipline, which has largely been abandoned, and partly because their real values were not fully understood. The restatement of objectives has come about through a better knowledge of relative values and a change in the philosophy of education which have clarified thinking and shown more clearly the objectives of various school subjects — industrial arts among them.

The following seems to be the chief objectives for industrial arts in the senior high school, the order of arrangement not being significant: (*a*) manipulative aims, (*b*) information aims, (*c*) self-support aims, (*d*) aesthetic aims, (*e*) ethical aims, and (*f*) consumer's or utilizer's aims.

The Manipulative Aims

Practical processes rather than those which are purely educational should be selected for senior-high-school courses. Out-of-date methods of work should be avoided. Some machine processes that are not of an automatic type, especially those which have practically displaced hand processes, should be taught in the basic or fundamental trades wherever practicable. The important hand processes that are needed at home or on the farm should be fundamental during the junior-high-school period while the children are too young to handle machinery safely. The recent investigation of objectives for the the junior high school in industrial arts which was made by A. G. Brown and F. E. Tustison, of the Stout Institute, shows that one fourth of the time for industrial arts should be given to the development of these *handy-man* abilities.

During the senior-high-school period the fundamentals of trade technique should be taught by the use of trade processes and procedure whenever possible. Factory methods should be encouraged, but the jobs should be changed often. Knowledge of a variety of kinds of work with rather limited skill in each is more important than speed in doing a few kinds of work. Skill and speed can quickly be acquired along narrow lines in industry itself whenever specialization becomes necessary.

In the senior high schools of large cities, shop courses may sometimes be organized to meet the needs of different groups of pupils. The manipulative work given to a class of pupils who are preparing for college should differ from that given to a trade-preparatory class.

The manipulative work with materials should give experiences that are as valuable educationally as is possible. Some of our educational philosophers, among whom are John Dewey and William H. Kilpatrick,[2] have advanced the theory that we learn chiefly by experience. The industrial-arts teacher in the senior high school should find out the relative values of various shop experiences that will be of use to his pupils in modern life in the home, the shop, the office and the farm, and then choose those of greatest fitness. This will probably mean that his choice will include problems in woodwork, in the use of electrical devices, the care and repair of automobiles, etc. While it is true that the manipulative process may have some value to the pupil or to society, the more important phase educationally is through experience which may be rich in meaning and be real living as well as a preparation for living.

Manipulative work of various types may properly be taught in the senior high school. Industry in many lines needs highly skilled mechanics who can work effectively with hand tools. Such men can find employment in various places as wood and metal workers especially. The *all-round* mechanic or *handy man* cannot easily be taught in highly specialized industries, because the employees who work there are usually semiskilled machine operators or unskilled laborers tending automatic machines. The senior high school can train in a variety of processes that are needed by the *utility man* or the *all-round* mechanic, but it cannot train on special automatic machines because of their great diversity and the expense of equipment.

Boys under 16 years of age should not be allowed to operate dangerous machines, because of the danger to themselves and others. In case of an accident in Illinois and in many other states, damages cannot be collected from the school district, but they can be collected from a teacher who has any property if the teacher is negligent and fails to make and enforce proper shop rules for the protection of pupils from accidents with machines.

Information Aims

Careful study of the industrial arts shows clearly that the various types of information, including a good scientific background for craftwork, are of equal or greater value to most senior-high-school pupils than are trade skills; largely because the latter can be acquired rather quickly in industry itself while the former cannot easily be so obtained.

Three types of information should be given in teaching manual or industrial arts either in the junior or senior high school. These types are generally known as (1) technical information, (2) related information,

[2]See William H. Kilpatrick, *Twenty-five Years of American Education*, Chapter 3.

and (3) occupational information. Tustison and Brown in their investigation found that each of these types of information should be emphasized in the junior high school and that each of them should occupy about one eighth of the time given to industrial arts, the other five eighths being given to manipulative operations.[3] In the senior high school which usually gives double periods to industrial-arts work, the teacher ought to spend at least three out of the ten periods on the various types of information. In my judgment this kind of instruction, where possible, should be given through class teaching which may be supplemented by carefully prepared information sheets, or by the use of books.

1. *Technical information.* The value of technical information in the senior high school cannot be overemphasized. The early industrial-arts teachers were inclined to stress the manipulative side and to neglect organized instruction in the technical information that was needed. In other words, these men taught constructive processes as an art, rather than as a science with a mathematical and scientific background. Our present-day industrial-arts teachers are usually not technical-school graduates, and often lack a good background of technical information for giving this organized instruction. There is a great need for more books which give richer technical information in great detail, and which are adapted for use in shop classes.

2. *Related information.* Educationally, the industrial arts are made richer and far more interesting if there is a rich background of related information given in connection with all manipulative work. Pupils of the senior-high-school period may gradually lose interest in the purely manipulative work unless they are given various correlations which add greatly to the subject content to these courses. In the metal courses there are the rich fields of metallurgy and chemistry to draw from. In woodworking there are both the scientific and practical to draw from in teaching about wood as understood by the botanist, chemist, and scientific technical experts. In wood finishing we have another splendid field for the study of materials through industrial chemistry, and the fields of trade and commerce which supply the materials for manufacturing a great variety of finishing products, such as oils, paints, shellac, varnish, lacquer, and enamel. Practical electrical work and auto mechanics offer other rich fields for related information that will interest and fascinate the senior-high-school pupil. Every teacher of advanced courses in the senior high school should be a student in these fields which open veritable gold mines of information for his classes.

3. *Occupational information.* This type of information also is needed, and should be given to the senior-high-school pupil. He should be given the kinds of information and experiences that will develop in him an appreciation of industrial problems both economic and social. Our early "manual-training" courses were said to have failed along this line according to the report of the industrial commission in Massachusetts in 1906. Other departments of the school can often give this form of information much better than it can be given in the industrial-arts department. Various departments of the school should be so coördinated that a higher type of industrial understanding may be developed, because of the great need for it by all persons whether they be workers or consumers. Information about the various occupations in a general way, the types of people needed for them, and the opportunities for entering them, are topics of interest and value that can be given to high-school pupils. Only a very limited amount of time from shopwork can be spared for this work which should largely be done by other school departments.

As a matter of fact, the amount of time that can be taken away from manipulative work in shop courses for information must be limited. Demonstrations and informational teaching should not occupy more than three tenths of the time, and they should stimulate thinking in connection with manipulative work.

Self-Support Aims

Schooling for many pupils ends during or at the close of the senior-high-school course. For this reason the high-school curriculum should have something to offer to these pupils which is helpful in the way of self-support.

About 78 per cent of the males over 10 years of age and over 21.1 per cent of the females over the same age are actively engaged in gainful occupations according to the 1920 census.[4] Various investigations have shown that both general-high-school and technical-high-school education give workers greater earning power than those who do not possess such education. The technical-high-school graduate can enter industry as a junior engineer on a higher level and with a better future expectation than a boy of the same age with only an elementary or junior-high-school education.

The pupil will be greatly benefited if he learns, during his high-school career, something of the economic and social relations of the individual to society. The least contribution that a self-respecting man can make to society is the independent support of himself, and of his family if he has one.

The results of a questionnaire study of the high schools of California during 1925 by State Commissioner of Vocational Education Nicholas Ricciardi[5] are of interest in this connection. Mr. Ricciardi reports that replies came back from 150 typical high schools enrolling 192,015 pupils during the year 1919–1923.

"Of this number but 19 per cent, or 36,159, graduated. And of the total enrollment but 14,987, or only 8 per cent, went on to higher institutions of learning. Thus we see that even of those who graduated but 41 per cent went on for advanced study."

[3] See A. G. Brown and F. E. Tustison, *Validation and Time Distribution of Concrete Objectives for Junior High School Industrial Arts*, Bureau of Educational Research, Stout Institute, Menomonie, Wisconsin, April 10, 1928.

[4] See Bessie Bunzel, "The Woman Goes to College," *Century Magazine*, Nov., 1928, p. 28.

[5] See Nicholas Ricciardi, "For What Occupations Should the State Prepare Its Workers," *Industrial Education Magazine*, Nov., 1925, pp. 141–143.

Mr. Ricciardi states further: "That the high schools must provide a program of education that trains young people effectively for the vocations for which they are best suited and through which they can make their best contribution to economic needs. That this may be done the schools must endeavor (1) to guide each youth into that kind of work which he likes and can do best, (2) aim to train him most effectively in terms of his own capacities and interests, and (3) also go so far as to assist him in securing suitable employment."

Aesthetic Aims

Nations in their pioneer stage must of necessity consider utility first and beauty afterwards. This same order of advancement usually holds good with the individual as well as with the group, such as a city or a nation. The best time for the development of appreciation and the acquirement of aesthetic standards is during the period of youth — especially within the senior-high-school period. Appreciation of the aesthetic, psychologically seems to be dual in nature, for one aspect or salient characteristic — the *emotional* — seems to be God-given, while the other phase — the informational — can be acquired. The emotions are easily stirred during the adolescent period when the boy or girl is in the senior high school, consequently this period is the best time for establishing ideals of beauty through attractive information that appeals to all that is highest and most refined in the human being.

Good design should be very greatly stressed in connection with its application in all craftwork. The success of the individual in industry and the leadership of our nation as a producer of manufactured goods, compared with other great nations of the world, depend upon a subtle attractiveness that comes from beauty of design. Good taste and a knowledge of what is beautiful are so fundamental to our success as a manufacturing nation that the schools cannot neglect this highly cultural phase of vocational education.

For this reason, our mechanical-drawing courses ought to be reorganized in order to emphasize the various principles and details of good design, even at the sacrifice of a few old-fashioned formal geometrical problems or purely manipulative pen exercises. Many mechanical-drawing teachers have had little art training and do not themselves know what is good in design. They think that decorative design belongs to the art department and is a feminized subject unworthy of the attention of red-blooded men. This objection, however, is indefensible, because the women of the country are much interested in art and beauty in home furnishings; and they really buy most of our manufactured articles, thus controlling the sales end of industry. The successful manufacturer is beginning to call for better designers because he knows that he must meet the feminine demands for more artistic goods. In the purchase of manufactured articles a man is apt to think of the construction, while a woman will reach her decision largely through appearance and convenience. All of these characteristics should be taken into consideration when purchases are made.

The fundamental principles of design in a practical, usable form, ought to be better taught in our schools. Art departments are apt to give too much formal work or select problems for illustration which have little application in industrial-arts work. Drawing window designs on rice paper with a Japanese brush, may be someone's conception of art instruction, but it is of little value to the student or the teacher of industrial arts.

Industrial-arts teachers can help in the solution of this problem if they will themselves take good college courses in art and design and then offer senior-high-school courses in design and construction using material and information taken from both the fine and industrial-arts fields. We need more books of the nature of Professor Varnum's *Industrial Arts Design* as guides in conducting such courses. The trouble is that many art teachers have the idea that art or design principles cannot be stated in the form of concrete rules or principles. The exponents of fine arts are vague in their statements and tell us that art principles and methods can only be learned through feeling and doing. They forget that there is an information side to appreciation that can be developed and that here is a field that needs clear thinking, more information, better books, and better teaching.

Character Aims

Industrial arts, when properly taught, can aid in the development of character, because worthy habits, attitudes, a personal responsibility, the spirit of service coöperation, and civic values, and some appreciation of the world's economic problems can be taught in a forceful manner. In this day when respect for law seems to be fast disappearing, the various means of developing a good ethical character ought to be considered of supreme importance and be ranked as coming before either intellectual or physical education.

Of course, no modern industrial-arts teacher believes that the manipulative act of squaring a board helps materially in causing the boy to be "square" in his dealings with other people. But he does believe that attractive manipulative work that charms the adolescent youth into pleasant dreams of construction and accomplishment, does help in establishing good habits, ideals, and attitudes which are useful and worthy.

The routine of well-organized industrial work causes the adolescent youth to feel that he *is* living, not simply *preparing* in an abstract way for living. Boys and girls who personally construct various articles appreciate the amount of labor that is required in production. The constructive instinct and its opposite, which is sometimes called the "destructive" instinct, are closely related psychologically. The use of the urge to construct, however, is apt to cause the inhibition of the destructive side of human nature. In the industrial-arts courses

pupils learn the value of exactness, of economy of material and time, and they gradually acquire resourcefulness and independence which are all a part of the development at which education aims.

Consumer's Appreciation or Utilizer's Aims

1. *Purchaser's training.* All high-school pupils become consumers of the various products of industry and are much benefited by all of the three types of information that the school can give them. The technical information and manipulative experiences, which are the helpful factors in arriving at judgments of the good in construction, can be obtained from high-school courses in the industrial arts. The related information, which gives knowledge of the materials which are used and their relative values, adds more data in helping a purchaser to decide which articles suit his needs. Knowledge of design and artistic taste are other factors that influence a well-trained purchaser.

2. *Citizenship training.* Knowledge of construction and information about the crafts are valuable sociologically to a consumer in a democracy because they tend to reduce class prejudices which are still strong under our present methods of conducting industry. Any person who has laboriously produced articles in a shop will have a better realization of the value of labor and possess more sympathy for the laborer. He may learn that all capital is the product of labor and learn thrift. He may also become more interested in the condition of those who are the producers in industry and especially of the very pitiable struggle of women and children in industry, all of which might be improved if the purchasing public were better informed. Every investigator of the work of women and children in industry in the United States knows that the wages paid to them are pitiably small, and that women have little chance of advancement in the unskilled work of operating automatic machines, which is the type of work that gives most of them employment.

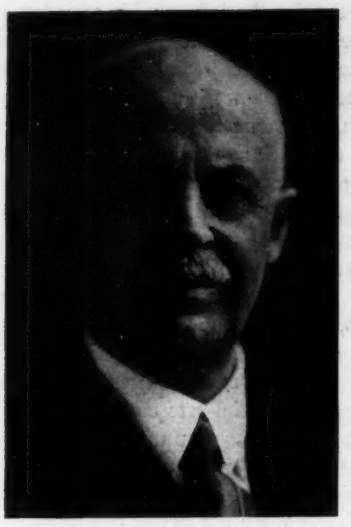
Attitudes toward labor or civic righteousness can thus be established in industrial-arts courses. This is citizenship training or civic education which should not be overlooked.

3. *Utilizers' training.* Persons who have had senior-high-school manipulative work are better equipped for living under modern conditions using the many mechanical and electrical devices that are now available than are young people who have not had such training. Since all people are utilizers of the products of industry, it is plainly evident that all would be benefited by the type of industrial-art training described in this article.

Milwaukee Bids the A. V. A. Visitor Welcome

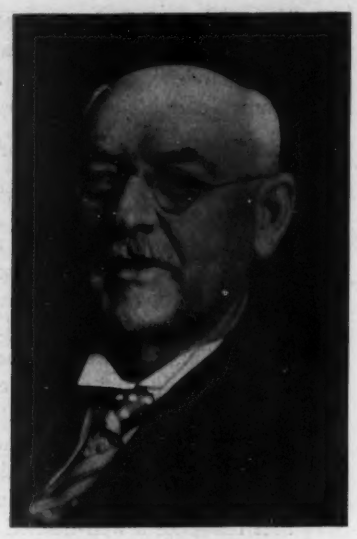
Of Milwaukee's nine public high schools, the one that will prove most interesting to industrial-arts and vocational teachers is the Boys' Technica' High School. Of course, the other high schools can boast of shops that are well laid out and well equipped. Each of these high schools is well worth a visit. The voca-

BOYS' TECHNICAL HIGH SCHOOL, MILWAUKEE, WISCONSIN



MR. R. L. COOLEY
Director, Milwaukee Vocational School, Milwaukee, Wisconsin

MR. WILLIAM F. RASCHE
Principal, Milwaukee Vocational School, Milwaukee, Wisconsin



MR. JAMES L. COX
Principal, Boys' Technical High School, Milwaukee, Wisconsin

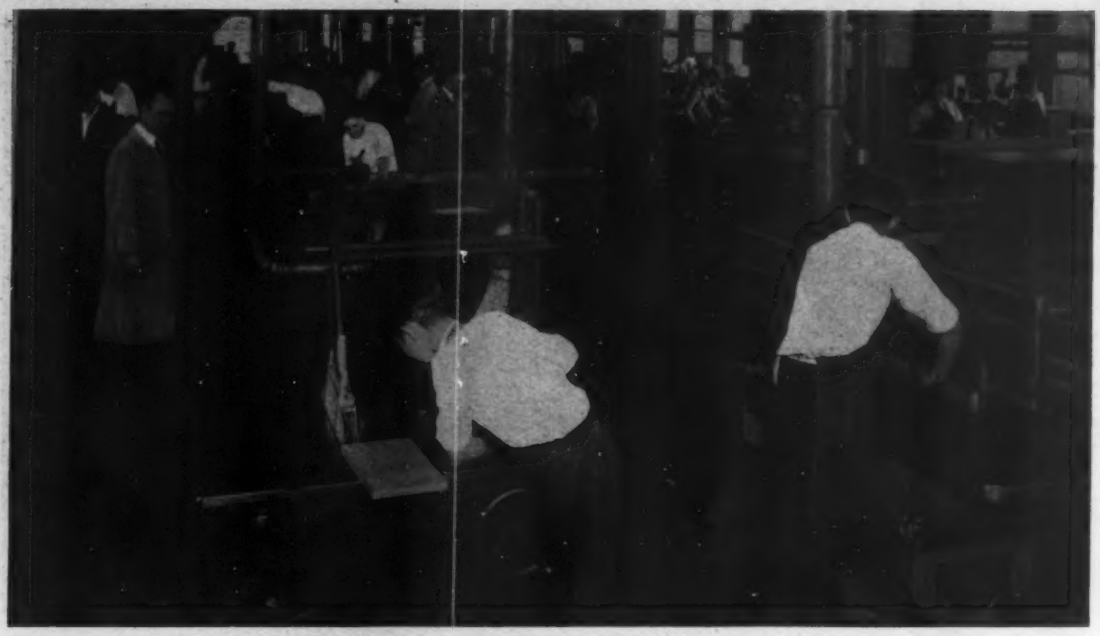
tional appeal offered by the Boys' Technical High School, however, will naturally impress the members of an association such as the A.V.A. more than would merely industrial-arts shops.

Visitors to this school will be especially impressed by the type of equipment found in the shops. Portraying, as this school does, the shop in the industrial plant, the school equipment has been chosen with the idea of presenting opportunities to the students for working on machinery such as he will find in his future place of employment. Of course, both the older and the newer industrial eras are portrayed in the school, and while there are large groups of various tools that are belt driven, the newer motorized machinery is used to a great extent.

This school is not a recent product. Its beginning goes back 24 years when it was opened, not as a public school, but as a private institution conducted under the auspices of the Merchants and Manufacturers Association. At that time it was financed by the money obtained in the form of tuition and from private contributions. About one and one-half years after its opening, the school was annexed by the city education system, after which it was known as the Milwaukee Public School of Trades for Boys. In 1927 a complete junior- and senior-high-school system was added to the trade courses that were offered, and thereafter the institution was known as the Boys' Technical High School.

To understand fully what this school stood for at its beginning and what it stands for now, the visitor should not fail to meet Mr. James L. Cox, the principal of the Boys' Technical High School. This man, who has been the guiding genius of the school since its inception, is a rare combination of the skilled, practical man and the enthusiastic, painstaking teacher.

ONE OF THE WOODWORKING SHOPS, BOYS' TECHNICAL HIGH SCHOOL



THE MILLROOM, BOYS' TECHNICAL HIGH SCHOOL

After finishing off the high-school course which he obtained at Norwich, New York, with mechanical engineering work at Cornell University, Mr. Cox entered the engineering department of the old E. P. Allis Co., later known as Allis-Chalmers Company at Milwaukee. While figuring out knotty engineering problems during the day, his untiring energy and his love for young people prompted him to teach mechanical drawing, kinematics, strength of materials, mathematics, and other engineering subjects in the evenings. Small wonder then that he should be chosen for the position that he now holds.

Nothing gives him greater delight than to tell his visitors just what the school offers to the industrially minded boy of Milwaukee. Using his own words "the Boys' Technical High School is especially organized to meet the needs of three distinct classes of boys:

"1. Any boy who has finished the sixth grade may continue his schooling here, receive the benefit of vocational guidance through the medium of a variety of

THE OLD MACHINE SHOP, BOYS' TECHNICAL HIGH SCHOOL

THE ELECTRICAL SHOP, BOYS' TECHNICAL HIGH SCHOOL

shopwork and shop trips, and be taught by specially prepared instructors in departmentalized classes, organized on the basis of a three-year junior high school and a three-year senior high school.

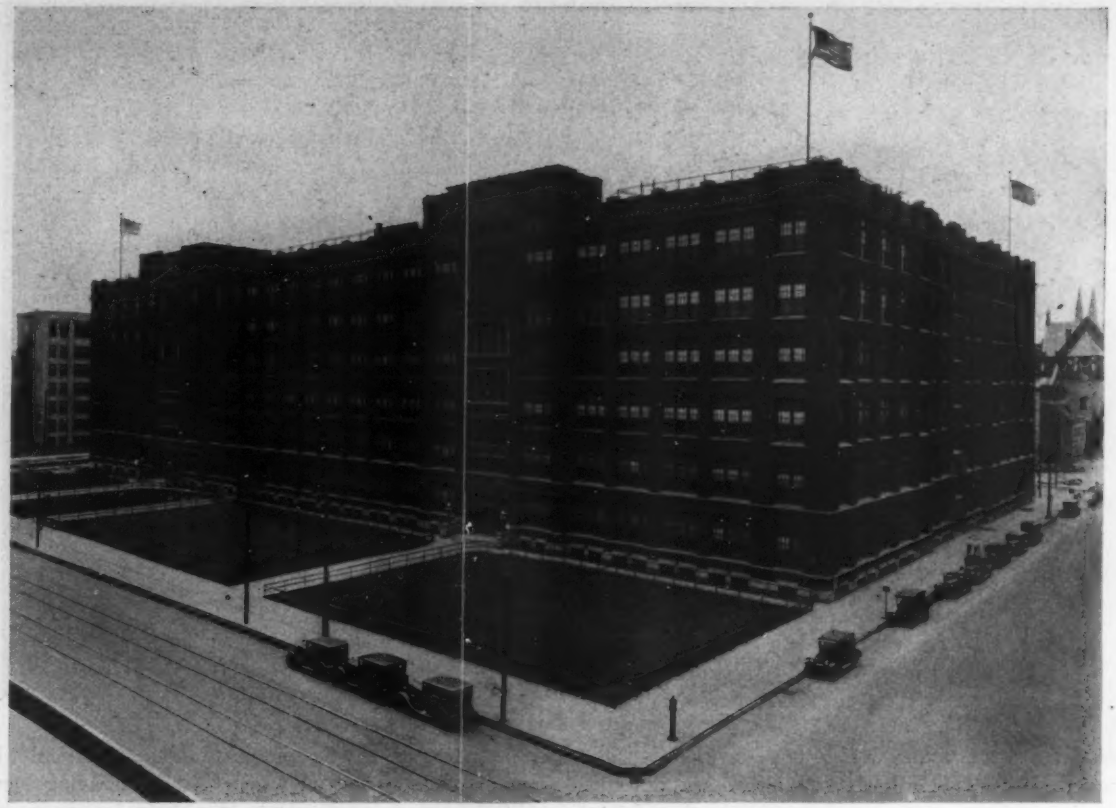
"2. Any boy regularly prepared to enter high school who desires to learn a trade and at the same time prepare himself for a college course in an engineering or technical school, finds here the combined opportunity for these two types of work.

"3. Any boy 16 years of age who wishes to give up his regular academic classwork and prepare himself in the shortest possible time to enter the industries as a skilled mechanic, will find two-year unit trade courses outlined for him in all departments, and may enter at any time during the year."

Not satisfied that the day school should give the boy who can attend full time, a good preparation for his entry into the industrial life of the city, the opportunities are extended also to the young man and adult who cannot find time or opportunity for full-time attendance, in the form of a Mechanics' Institute which is held three evenings a week for seven months each year. Those who attend the Institute have a real opportunity to either learn a new trade or to advance themselves in a trade at which they already are working.

The subjects of study that are offered in this school are civics and history, English, modern languages, mathematics, music, science, architectural drawing, auto mechanics, cabinetmaking, carpentry, commer-

THE GRAY-IRON FOUNDRY, MILWAUKEE VOCATIONAL SCHOOL



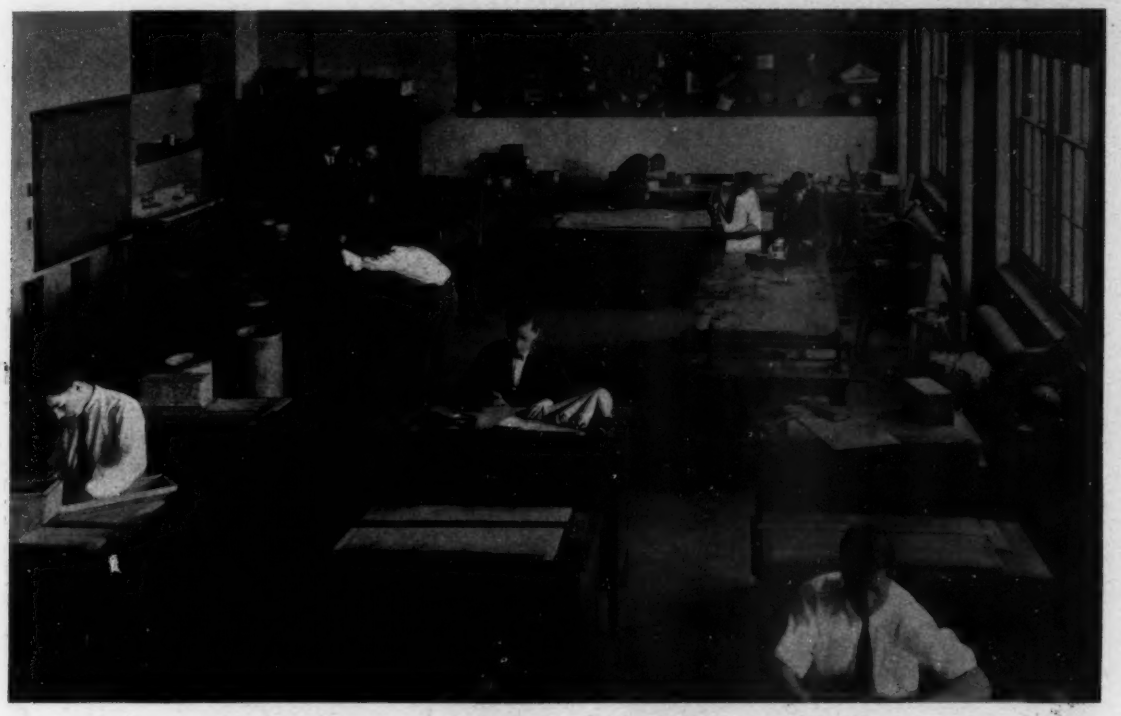
THE MILWAUKEE VOCATIONAL SCHOOL

cial art, electricity, mechanical drafting, machine and tool making, pattern shop, plumbing, and printing.

Industrial education in Milwaukee is not confined to the boys alone, hence those who are interested in this type of training for girls should visit the Girls' Trade and Technical High School in which Miss Ora A. Blanchar does for the girls what Mr. Cox does in his school for the boys.

Another school equally important to industrial Milwaukee is the Milwaukee Vocational School. It was created by the legislature of 1911, and has for its main objective the giving of part-time instruction during the

THE TAILOR SHOP, MILWAUKEE VOCATIONAL SCHOOL



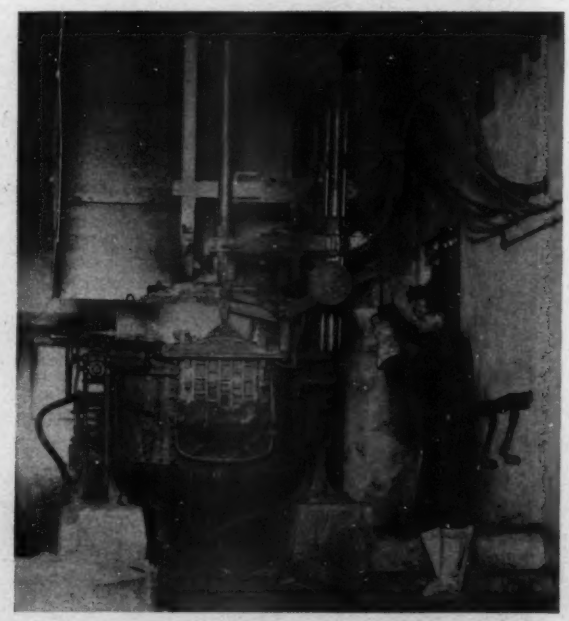
THE SHEET-METAL SHOP, MILWAUKEE VOCATIONAL SCHOOL

daytime to the young worker between the ages of 14 and 18 years. This in itself is no mean task, but added to it is the tremendous responsibility of giving the part-time instruction demanded by the Wisconsin Apprenticeship Law, to upward of 1,100 apprentices who are at present learning various trades in the city of Milwaukee.

But even this does not cover all of the work done by the school, because we find there several hundred young Milwaukeeans who receive full-time instruction during the day in commercial subjects. The total attendance of these various daytime classes is about 13,000 per week.

Commencing in September and running through until the end of May, evening classes are held which are attended by about 8,000 students each week. The contacts which this school through its various departments makes with the industrial life of the city, can hardly be visualized. Many of the most important plants no longer advertise for their juvenile help, be that for ordinary juvenile employment opportunities, or for learners to fill the annual replacement quota necessary in the ranks of the skilled mechanics. They depend, for this service, on the placement bureau of the Milwaukee Vocational School. So well has this department of the school solved its problem that in the school year 1929–30, despite the scarcity of juvenile jobs, 4,400 of the young people between the ages of 14 and 18 were placed.

The courses of instruction opened to boys in the daytime classes are architectural drafting, automobile mechanics, automobile electricity, art-glass work, baking, bank clerking, barbering, bricklaying, cabinetmaking, carpentry, commercial art, cartooning and newspaper art, cost clerking, drafting, electrical wiring, electric motors and generators, engraving (jewelry), forging, hotel cookery for chefs, insurance and real estate, interior decorating, jewelry, machine-shop work, masonry, mechanical dentistry, meat marketing, mechanical drafting, millwork (woodwork), molding, music, optical work, painting, paper hanging, pattern-making, photography, pharmacy, plastering, plumbing, printing, radio construction, real estate, retail selling, sheet-metal work, shoemaking, shoe repairing,



THE ELECTRIC STEEL FURNACE, MILWAUKEE VOCATIONAL SCHOOL

THE COMMERCIAL ART ROOM, MILWAUKEE VOCATIONAL SCHOOL

show-card writing, sign painting, steam-engine operation, steam fitting, stenography, storage-battery maintenance, tailoring, typewriter repairing, upholstering, wood finishing, watch repairing, and welding.

Besides the ordinary homemaking classes offered to the girls, the following industrial and commercial courses also are offered: Bookkeeping-machine operation, comptometry, dressmaking, filing, hair dressing (beauty culture), millinery, power-machine operation, stenography, and typewriting.

Here too, the physical part of the school is but a part of the whole. The human element that made this institution what it is today must not be overlooked. There is first of all, Mr. Robert L. Cooley, the director of the school, who may well be called the "Grand Old Man" of vocational education in Wisconsin. Raised in a country district, he is no stranger to manual work himself. Despite the fact that his entire teaching experince — which ranges from classroom teacher to superintendent — is of the academic type, his own love and appreciation of industrial and mechanical processes have made him an ideal champion of the continuation and vocational-education idea. Of course, he needs no introduction to A.V.A. members. His activities as lecturer on vocational education, as president of the American Vocational Association, and as general chairman of the convention to be held December 10 to 13, 1930, have made his name a byword throughout the United States.

It would be wrong not to mention the part which the activities of William C. Sieker, first principal of the school, and Robert H. Rodgers, founder and first chief of the teacher-training department had in the upbuilding and upgrading of the internal operation of the school. They have gone to their reward, but the structure that they helped to erect is living after them to their greater honor and renown.

Mr. William F. Rasche, successor to Mr. William C. Sieker as principal of the Milwaukee Vocational School, does not need an introduction either. He and his work are favorably known in more than one state of the Union. Educated to be both a skilled craftsman and a master teacher, he has held responsible positions in both the industrial and educational fields, and the work that he has already accomplished in his present position shows that he is a worthy successor to the man who so ably assisted Mr. Cooley when the Milwaukee Vocational School was in its infancy.

It is not in a boastful mood that Milwaukee points out these high spots that may interest the A.V.A. visitor, but rather with the hope that Milwaukee's offering in the field of industrial-arts and vocational education may be refined and improved by the experiences which the thousands of men and women will bring to Milwaukee during the coming convention.

DEMOCRACY'S RESPONSIBILITIES

To provide such training (vocational) is clearly a public responsibility. Education in general, including vocational education for the youth, is democracy's most important business. — *Herbert Hoover.*

INDUSTRIAL ARTS and VOCATIONAL EDUCATION

J. J. Metz, Editor

OVER-INDIVIDUALIZATION

We frequently hear the individual instruction sheet praised because it permits each student to advance at his own rate. By its use, the exceptionally bright student is given every opportunity to get the utmost out of the course which he is taking, while the abnormally slow also is, with the aid of the teacher's sympathetic encouragement plus the individual instruction sheet, given a real opportunity to get as much out of the course as his ability and capacity permits. Valuable as this method is, care must be taken not to unduly overemphasize the individual side of the work, for fear of creating large numbers of young people who have been so individualized that they cannot function as a group.

One of the comments during the world war was that the German soldier was wonderful when he was doing his part in a mass formation. His entire training had developed him to react immediately to the commands of his superiors. Take away the superior, however, and the German soldier became a very uncertain quantity. He had been taught to do what he was told, and to implicitly carry out an order without doing any thinking of his own. The American soldier, on the other hand, had not been under military discipline long enough to become thoroughly imbued with the idea that he did not have to think through an order which was given him. He was not so quick in mass action as was his German antagonist, but he showed more initiative when he had to act without an immediate superior.

Whether these war observations are true or not, does not enter into this discussion. There are times when the individual must know how to stand alone. He must know how to go ahead on his own initiative. Then there are times when he must know how to be an active part of a whole, when he as an individual must see to it that the objective of the group is achieved. For this reason it is well for the teacher to recognize that at times group projects for the students must be fostered.

In modern industry the production method is a common thing. In schoolwork, it is not so common. Probably it is well that this is so, because if production is not carefully used in the school shop it defeats its own purpose. It may easily mechanize instruction to the detriment of the student. Out of instruction will then develop mere production, a thing against which the school must carefully guard.

When, however, the production method is sparingly used in conjunction with well-prepared individual instruction material, a happy combination is produced. On the one hand, there will be the advantages of the individual instruction which emphasizes initiative, and the development of the personal ambition to go ahead, to plan independently of others, to stand on one's own feet; and on the other, there will be the benefits accruing from the production job in which all participate, and which, when finished, does not represent the work of one individual but of the entire group.

It must be borne in mind, however, that production work should not be overdone. Used as an alternative method, as an antidote against the extreme individualization which may be the by-product of the individual instruction sheet, the production method in the school shop will do valuable service.

—•—

FAIR TREATMENT

In his article on "Specifying Equipment and Supplies for School Shops" in the May, 1930, issue of this magazine, Mr. Earl L. Bedell, assistant director of vocational education, Detroit, Michigan, touches on the subject of fair treatment to manufacturers and manufacturers' representatives in the following words:

"The vocational department in Detroit has tried to give a fair and equal opportunity to all companies to furnish equipment, irrespective of whether the equipment is carried as an 'open line' or otherwise. This is done by giving a complete and accurate description of each item. For example: 1. Saw, hand — 22 inch — 7 point — rip — taper ground — skew back — rosewood handle — blade high polish. Atkins Trade Number; Disston Trade Number; Simonds Trade Number; or equal."

Further on, in the same article, he says: "The writer has found that the specifications must be written to perform two very definite functions: The first is to give the bidder an adequate description of what is wanted. The second is to have the specifications so written that the bidders will be required to submit a proposal that will fully describe what it is proposed to furnish. The first requirement is the school's duty to the bidder. The second requirement is the bidder's duty to the school."

At still another place in the article, Mr. Bedell says: "These types of specifications (referring to sample specifications which are a part of the article quoted) should be used only if it is intended to give equal consideration to all makes of machines which meet the general requirements. If it is the intention to buy 'West end' lathes, then it is, to put it mildly, discourteous to cause the makers of 'North end' lathes and others to go to the trouble of preparing a proposal, leading them to believe their machines are being considered. Why not send an order to the 'West end' company in the first place? Why bother to go through the subterfuge of a competitive bid?"

What Mr. Bedell emphasizes in his article is merely a sane and honest method applied in a businesslike manner. A school management in deference to itself must necessarily subscribe to the sentiments expressed.

There is, however, still another side to this contact between school and industry, and that is expressed in the manner in which the manufacturers' representatives are treated. Everyone knows that school officials are tied down with many details and that they are exceedingly busy men. They cannot be at the beck and call of anyone who may want to see them. The legitimate caller, however, is presumably also a busy man to whom time is just as precious a commodity as to the school administrator. He, too, is entitled to courtesy and fair treatment. How to take care of the interests of both may frequently be a very difficult problem.

The Eli Lilly Company, of Indianapolis, Indiana, who manufacture biological and pharmaceutical supplies, is an old-established organization and their success is built upon the adherence to very definite policies in the conduct of their business. The caller at their office is ushered into a large reception room where he is courteously greeted by the telephone operator. The purpose of the call is stated and it is relayed to the individual called for with considerable dispatch.

A notice, prominently displayed in the office, expresses the policy of this organization toward salesmen calling on them:

"The reception lobby is provided for the comfort and convenience of visitors and salesmen. The telephone operator will assist you in securing prompt interviews with the one you desire to see. During unavoidable delays the writing table, telephone, and magazines are at your service. It is our wish to grant all salesmen and visitors the *same courteous reception that we ask for our own representatives* covering the United States and Canada."

This is a fine expression of courtesy, as applicable in the school as in business, and it no doubt builds up a great deal of good will. Business courtesy does not mean that a great deal of time must be given to people who call, but it does mean that proper consideration is shown to the visitor. Manufacturers' representatives will be only too glad to terminate an interview granted them under such conditions, and their appreciation, in most cases, will be expressed in more willing and more generous service.

DEFENSE MECHANISMS

Frequently there arise ludicrous situations in the classroom because of the ingenious explanations given by one or the other student to cover up a mistake or misstatement that he or she has made. How nimbly the mind suggests, and the tongue utters, these excuses that were born only after the deed had been done.

How frequently the teacher severely catechises and criticizes the student making use of such defense mechanisms, failing to remember that he, too, is prone to use the same method when confronted by a similar need.

How earnestly does not the teacher convince himself that an error that has been made is directly traceable to another's acts. How quickly does a convenient tired feeling develop into the magnitude of a near nervous collapse when the indulgence in a fishing-camping trip that replaced a projected attendance at summer school, must be explained.

A little self-scrutiny shows that the adult is as ingenious at fabricating these extenuating circumstances as youth. This fact must be placed into the balance scale when the excuses of the student are weighed. He may be just as sensitive to criticism as is the teacher. To preserve the student's trust in the teacher, the latter must use sympathy when he is passing judgment on the acts of one of his learners. Not for one moment is the pupil to imagine that his subterfuge is being accepted, but his mistake must be plainly indicated as a mistake, not as an attempt to lie or as a dishonest act.

So human is this use of defense mechanisms, that it seems to automatically begin to function, and the individual, especially the one who is gifted with a vivid imagination, may really have trouble in discerning where reality ends and fabrication commences.

Following the biblical advice, then, of judging others as one wishes to be judged, demands that the teacher go to some lengths in order to really understand conditions as the student sees them. Fairness and justice demand this, and the student rarely fails to recognize when he is justly treated.

VOCATIONAL GUIDANCE

Communities as well as boys and girls need vocational and educational guidance. There is too much assuming on the part of individuals that because Bill Jones took a course in civil engineering and is now at the head of some big engineering concern at a large salary, such a career awaits every boy who takes such a course. They frequently overlook elements of heredity, physical strains, health, personality, perseverance, and scores of other traits and characteristics which cannot safely be ignored.

Youth is concerned about its destiny. Pray endow them with the true heart, the strong heart and love; but in addition give them the benefit of a worth-while and scientific guidance program administered by men and women who have demonstrated their interest in the welfare of our boys and girls and who have been properly trained for work in the field of guidance. — *Herbert L. Cushing*, Nebraska.

THE RIGHT TO AN EDUCATION

The humblest worker, equally with the youth who proposes to enter the professions, has a right to the sort of training he needs for the occupation by which he proposes to earn his livelihood and support his family and through which he will render his service to the community in getting the community's work done. — *Herbert Hoover.*

Modern Furniture for a 9 by 10-Ft. Room

*Alfred G. Pelican**

THE furniture illustrated in this article was created not because of a desire to do something bizarre or startling in design and construction, but because of a definite need for furniture which would be suitable for a small room, and at the same time easy to construct, appropriate in function, and not too strenuous on the pocketbook. In other words, there were physical, technical, and economic limitations which had to be taken into consideration.

The important question in designing any object is not whether it should be modern or antique, simple or ornate, composed of straight lines or curved ones, painted or stained, heavy or light, and so forth, but whether it is best suited for the purpose for which it is intended, and whether it fits into the surroundings in which it is to be placed. This latter point is almost as important as the one first mentioned.

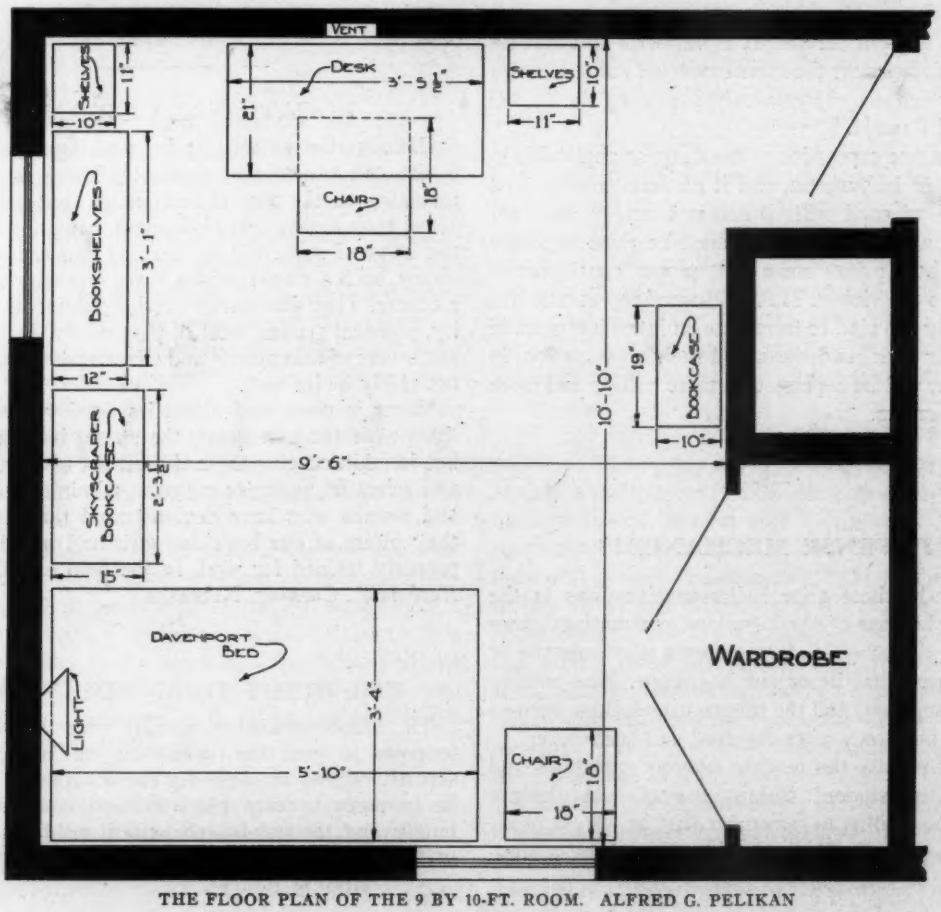
Many objects made by manufacturers or in the industrial-arts shops of the schools are fine in themselves, but frequently they do not harmonize with or fit into the homes for which they were made.

*Director of Art Education, Milwaukee, Wisconsin.

A typical example can be cited with regard to the overstuffed suites of furniture which are part and parcel of almost every average American home. This overstuffed furniture, which looks so appropriate on the floor of a large furniture or department store, assumes, an entirely different scale when placed in the small rooms of an apartment, or bungalow, or duplex.

The room for which the table, chair, and bookshelf illustrated herewith, were designed, is a small room which is to be used as a study and bedroom. It immediately becomes apparent that in a room of such restricted dimensions, the utmost economy of space will have to be exercised in order not to destroy the scale of the room and to make it possible to pass in and out without bumping into projections, or without having to move or step over pieces in order to get to the windows, heat vents, or closets.

The floor plan of the room shows the location of the furniture. One of the first problems to be considered in designing the writing desk was the fact that the only suitable place for it was against a wall in which the opening of the heat vent had been placed. By group-



THE FLOOR PLAN OF THE 9 BY 10-FT. ROOM. ALFRED G. PELIKAN

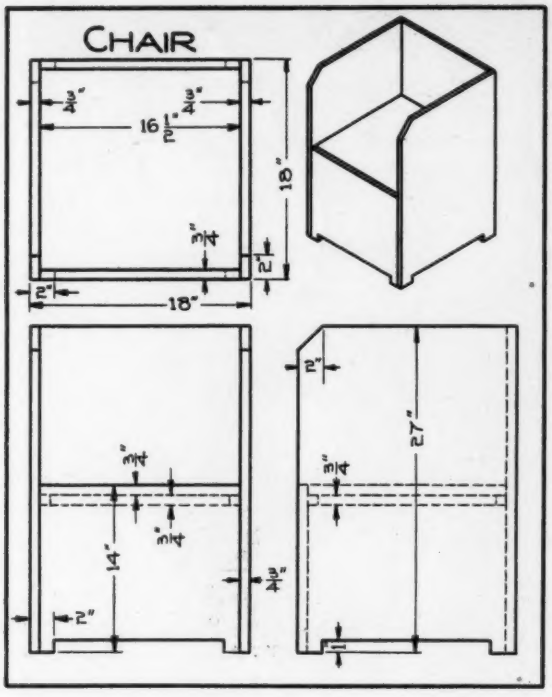
APPEARANCE OF THE FURNITURE IN THE ROOM

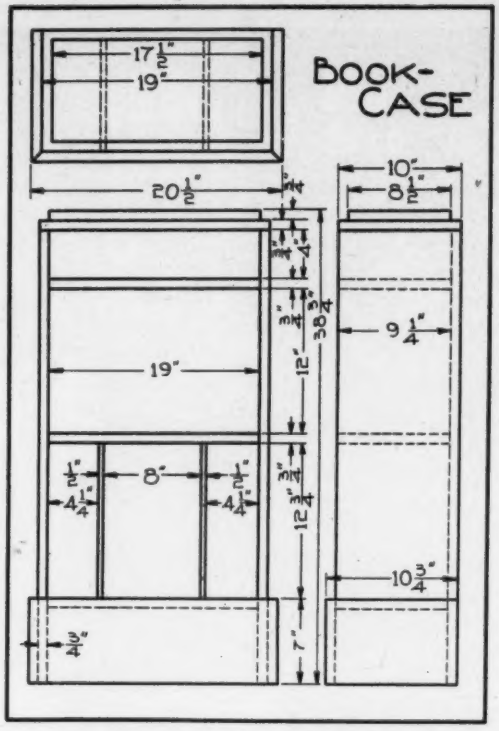
ing the drawers on the left and planning the open space in such a manner that it would come over the heat vent, the desk could be placed against a wall without interfering with the heating of the room.

Since an ordinary chair seemed clumsy and out of proportion with this desk and since the back invariably protruded above the top, a simple chair was designed sufficiently large to assure comfort, and yet compact enough to slide under the desk when not in use.

Both the desk and the chair were lacquered in black, because this color helps to visually reduce the size of these two pieces.

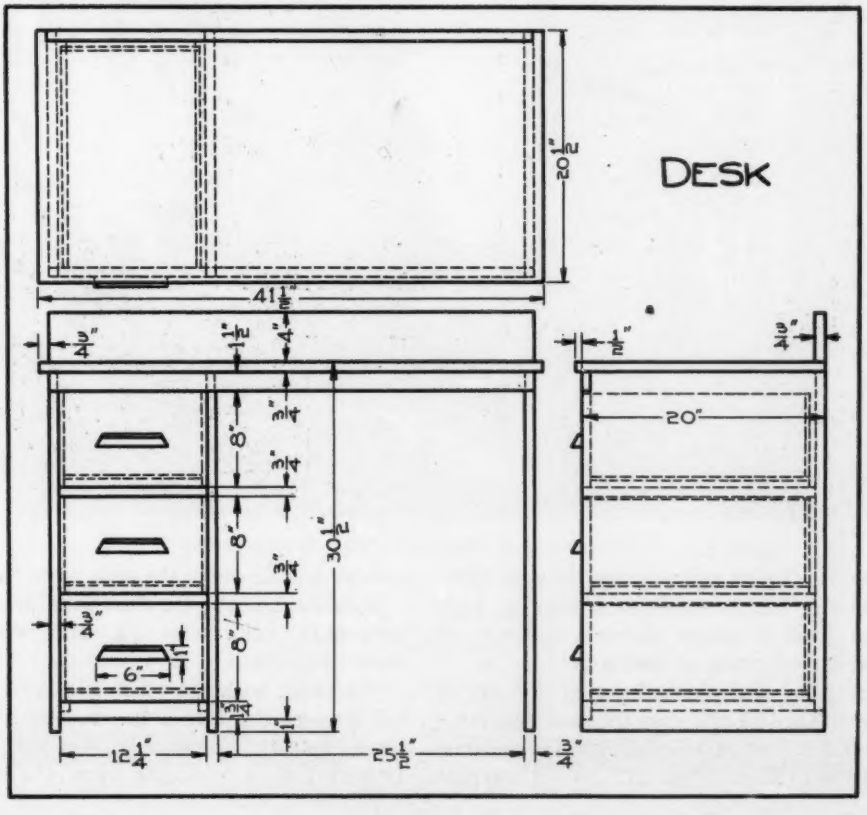
The small bookcase which had to fit into the space left between the door of the room and the door of the closet, had to be planned so as not to be too high or to project too far into the room. The divisions of the





shelves were so divided as to enhance the proportion of the rectangles created by these divisions, and so planned as to take care of a variety of art books which are larger than the average library book. This piece was painted a light tan to match a number of narrow vertical bookshelves which are indicated in the floor plan.

The entire project of designing these pieces depended on the arrangement of good proportions of height to width and of an interesting and varied division of ver-



tical and horizontal lines. By keeping to simple flat planes and surfaces, greater unity with the flat planes of floor, walls, and ceiling is maintained, and an atmosphere of quiet dignity and restraint is produced which is conducive to the contemplation and study for which the room is intended. These simple surfaces and unornamented planes may not appeal to the individual who responds more readily to the sensuous, curved, rhythmic lines so commonly found in periods of the past. The difficulty with period furniture is that the large spaces for which it was originally planned are no longer possible because of the restriction of property, the curtailment of space in the small home, the lowered ceilings, and the utilization of every available corner.

The furniture herewith illustrated is masculine in character and therefore particularly appropriate for a boy's or man's room. It is solidly constructed and very inexpensive. It also is expressive of the studied simplicity found in our modern skyscraper architecture.

For the student it seems to present the logical starting point in design, as it is an easy matter to elaborate on any of these pieces after the simple proportions have been carefully studied and the general mass found satisfactory.

The furniture was made by students in the woodworking class of Mr. Sanborn at the Boys' Technical High School, Milwaukee. The costs were as follows:

Stand	$1.60
Chair	1.75
Desk	4.50
Total	$7.85

The educational value contained in a problem of this kind is in the restraint which it imposes upon an otherwise complex problem. Just as in painting, the difficulty with the beginner is not to know what to put in a painting or a design, but what to leave out. The statement that orderly simplicity is better than disorderly complexity is one which should be considered by every student of the fine and industrial arts.

Modern Methods in the Teaching of Printing and Typography—I

*Arnold Levitas**

SINCE the organization of the teaching of printing in the public schools, several different methods have been tried out; and, by gradual stages, this work has advanced to a more scientific and effective stage of existence. It is a far cry from the crude attempts of apprenticeship training in the shop of a former day to the systematic means used in the modern trade school. There still remains much, however, that may be done in the matter of improvement and advancement.

Shopwork Courses

When the teaching of printing first originated, the instructors were drawn directly from the commercial printing shops. Very few of them had any understanding of what methods were to be employed in teaching others. As time went on, instructors were encouraged to take courses in teacher training; and these studies, coupled with the experiences which they had accumulated in the classroom, made it possible for them to introduce system into their work.

In each case, the instructor developed his own course of study, so that in a short time, there were almost as many different courses as there were printing classes. After a while, teachers got together and compared notes, and from then on courses and methods began to show more similarity and harmony. Then some teachers began to publish their courses, or outlines of them, and a few of the more enterprising wrote textbooks, showing not only method, but content and adaptability of their courses.

*Instructor of printing and typography in the Public Schools of New York.

The matter of developing a course of study for the shopwork, however, was a task much simpler than that of fitting to it a practical and useful course of correlated academic work. At first, the academic subjects taught in the trade school were similar in method and content to those taught in the elementary and high schools; but it was soon realized that different methods and content were needed for effective results.

Courses of Study for Correlated Work

For teaching English to students in printing, a special course was developed, which emphasized such phases of printing as proofreading, punctuation, capitalization, division of words, copy preparation, etc. Likewise the arithmetic for the printer was made to embody problems on the point system, stock cutting, computation of space, and cost estimating. Design and drawing for the printer were made to include lettering, study of type faces and ornaments, planning and layout work, decoration, etc.

Besides these major subjects there was also prepared and included a minor course in correlated work, embracing science, history and civics, economics, and industrial hygiene. In the courses in science, talks on the making of type, paper, and ink; explanations on how electrotyping, stereotyping, and photo engraving is done; and descriptions of linotype, monotype, and the printing press, were found helpful and practical. Under history and civics, the history of the printing industry, the life of great printers, apprenticeship training, modern labor laws, printing in America, and other subjects connected with printing were developed.

In the field of economics, the social and economic development of printing, present business methods and customs, production in printing, conversation, associations of masters and journeymen printers, the young man's opportunities, etc., were selected for discussion. In the study of hygiene, talks on the hazards in the shop, the prevention of accidents and disease, and first-aid remedies were used.

These academic studies have been used, more or less effectively, in several of the best schools; but there is still much room for improvement in both the methods used and the content of the courses. Up to now, only a slight beginning has been made in the teaching of related work in printing, but the teachers of this subject are working hard to improve upon what has been accomplished to date.

The Three Methods for Correlated Study

Although the correlated academic courses in printing used today in many schools tend to be of a practical, rather than of a purely academic nature, yet they are, as subjects, mostly independent; that is, while they are related to printing in general, no special provision has been made, as a rule, to relate the theoretical matter to each specific project, or job. There are many educators who believe that the best kind of academic work in printing is that which is so closely related to the particular job as to include every kind of academic subject for that particular job. On the other hand, there are men who feel that such teaching could not be practical or useful, because it would give to the pupil only a fragmentary idea of each academic subject, and it would take a long time for a candidate to grasp the complete subject. Besides, it would leave the student in utter ignorance about the theory of any new problem or project which had not been taught to him before. These people, therefore, advocate independent teaching of the related academic work.

There is a third class of educators, who would compromise between the two previously mentioned. These suggest that the academic studies be made to relate in unit form; that is, that, while a unit of ten lessons in shopwork is being taught, a unit each of ten lessons in related English, related arithmetic, and related design be given, and that this related work be so arranged as to bring out the theory needed for that particular unit in shopwork. This has been tried in a modest way; but so far it may be said to be still in its experimental stage.

Of the three plans suggested, it seems that the *unit plan* and *project plan* are destined for further future use in trade schools, each in accordance with its most appropriate place under certain conditions. The unit plan will probably be adopted by one school, and the project plan by some other school, depending upon individual preferences. The *independent academic plan* does not seem sufficiently appropriate for trade schools, and it will most likely not grow in favor to any appreciable extent within the near future.

(To Be Continued)

Frills and Try-Square

Superstition and Foresight

"How is the new house on Thirteenth Street coming along, Mr. Try-Square?"

"It is not coming along at all," replied Try-Square as he figured busily at his desk with a scant nod to the art teacher, who entered the office jauntily. "Indeed, it is in the way of going rather than coming."

"Ah! Too bad! Too bad!" said Frills consolingly. "And winter coming on with a big coal bill and the northwest exposure of that corner on Route Thirteen, Street Thirteen. I wonder that you chose that unfortunate location, Mr. Try-Square, with all of your business foresight."

"You wonder, do you, Mr. Frills? Well, you would wonder, I suppose. I chose that corner for my house after noting carefully that the nearest oil stations on Route Thirteen were a mile on each side of that corner."

"Ah! That was excellent judgment, Mr. Try-Square. I congratulate you on getting as far from one of those horrid oil stations as possible with your family nest. A mile is far too close, however, and I still wonder at your choice of a location on Route Thirteen and Street Thirteen, even though Park Avenue is a beautiful and promising residence street. I sympathize with you keenly Mr. Try-Square."

"Save your sympathy for a more worthy mortal, Mr. Frills. I am as happy as Croesus or John D. or any other magnate this morning. Mrs. Try-Square and I have had pipe dreams ever since we started that house on a shoe string. Now our dreams have almost come true. We were offered a handsome profit on that corner by the Golikell Gas and Oil Company, who support my judgment of a year ago. That corner is the best and only location for an oil station on the west side. A family nest that turns into gold before it is finished is a bigger boon to a teacher on a small salary than one which is ideal in other respects, but costs the bigger part of his salary for upkeep. Save your sympathy, Mr. Frills, save your sympathy! Thirteen is my lucky number."

Ripping Narrow Stock

The boy in the above picture is apt to be seriously injured. He is ripping a narrow stick and is using his fingers instead of a push stick.

Then too, the saw is clearing the stock too much.

Play safe when you are using dangerous machinery.

Safety Series—Roy R. VanDuzee, West Allis, Wisconsin

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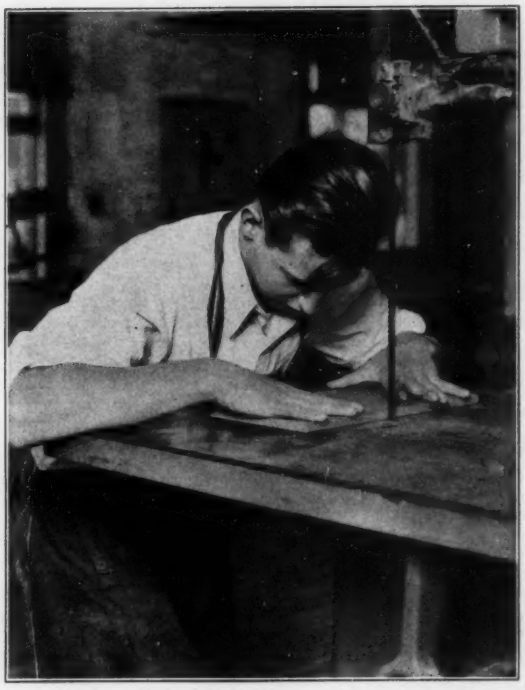
The Band Saw



The boy in the above picture may not only lose considerable hair, but he also may receive severe scalp wounds before the saw is through with him.

He should have lowered the guard so as to cover as much of the saw blade as possible before starting the saw.

Such an unguarded band-saw blade also is dangerous to arms and hands.

Be master of the machine, do not let it master you.

Safety Series—Roy R. Van Duzee, West Allis, Wisconsin

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DECEMBER, 1930

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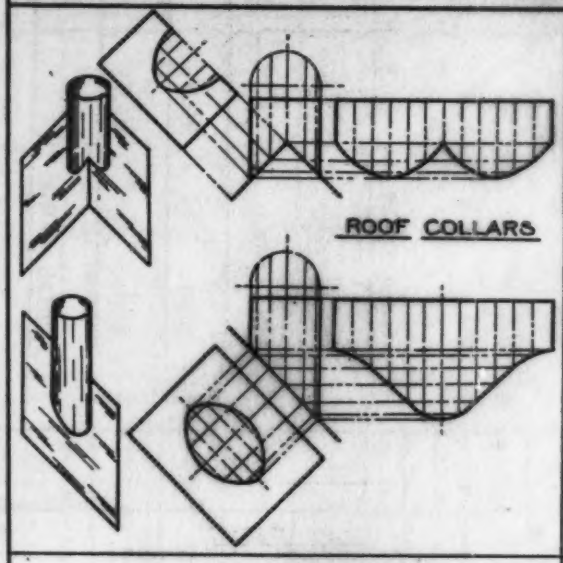
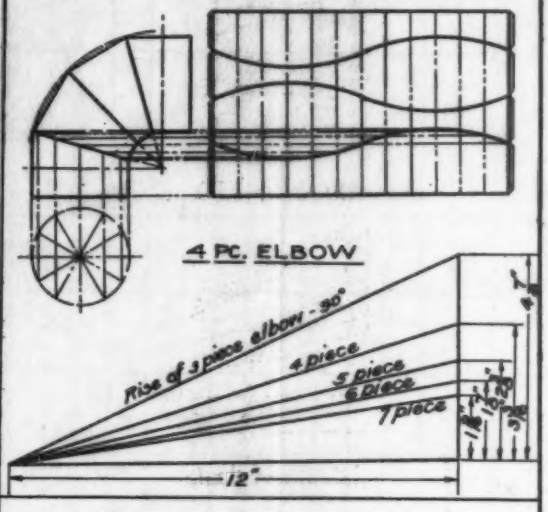
CHART OF TYPICAL PROBLEMS IN PARALLEL LINE DEVELOPMENT-By C.H. DERBY & J.F. FABER

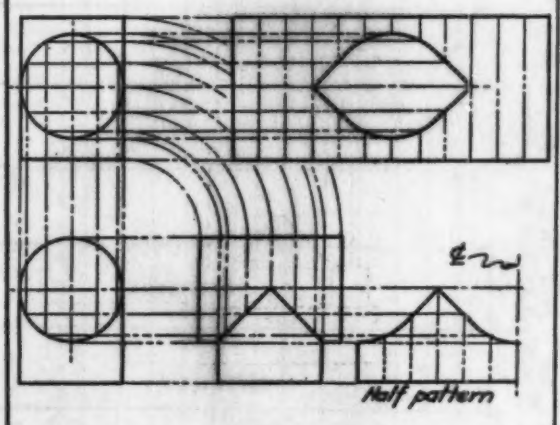


ROOF COLLARS

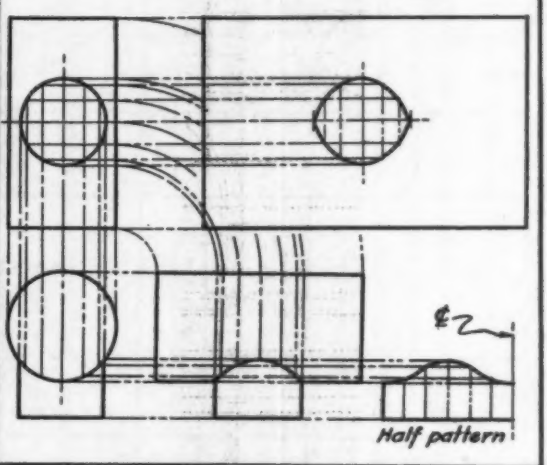


4 PC. ELBOW

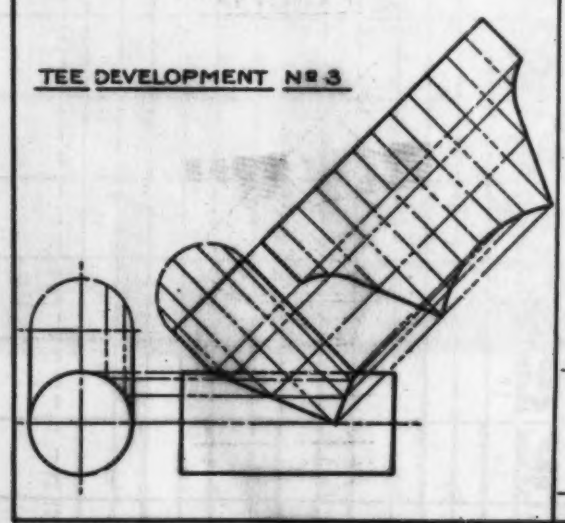
TEE DEVELOPMENT Nº 1



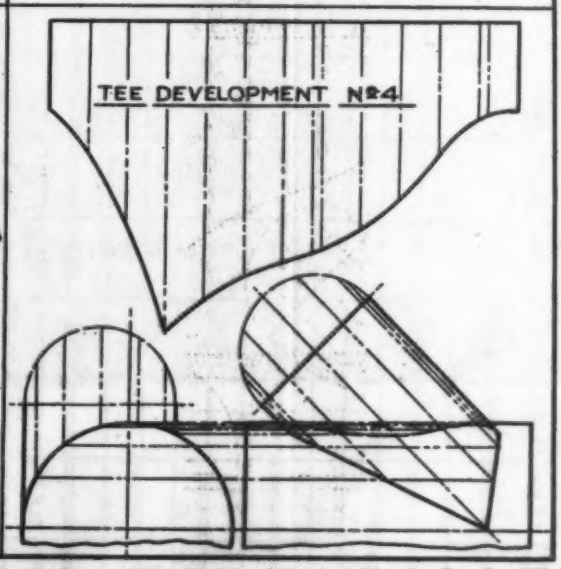
TEE DEVELOPMENT Nº 2



TEE DEVELOPMENT Nº 3



TEE DEVELOPMENT Nº 4



Designed by C. H. Derby and J. F. Faber, Erie, Pa.

For Description See Page 469, Industrial Arts and Vocational Education, December 1930

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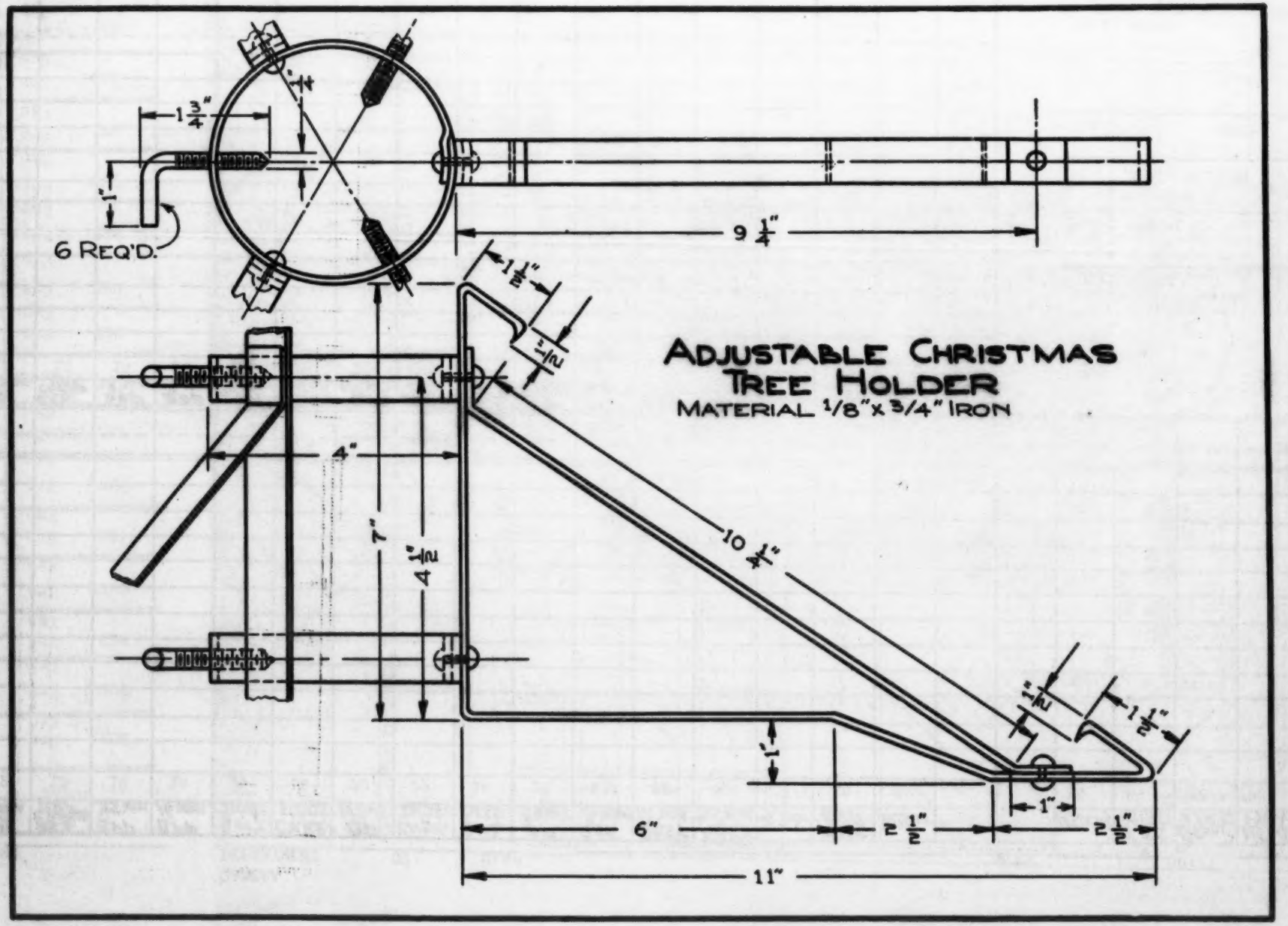

Designed by Arthur F. Ahr, Buffalo, New York.

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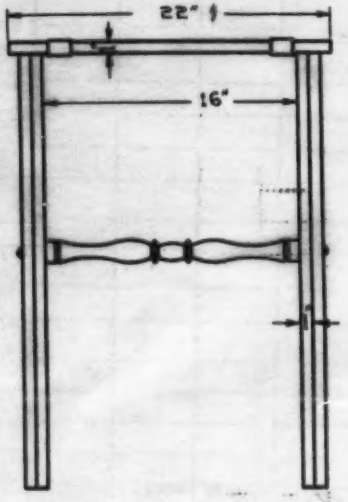
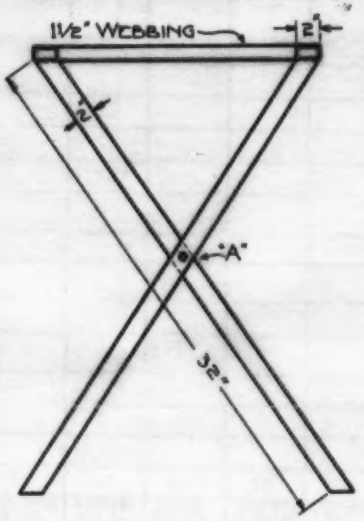
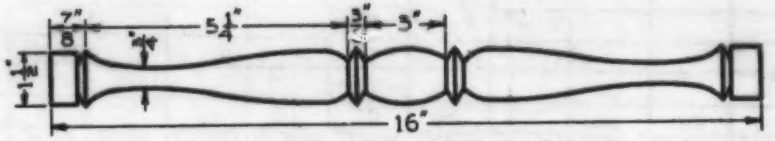
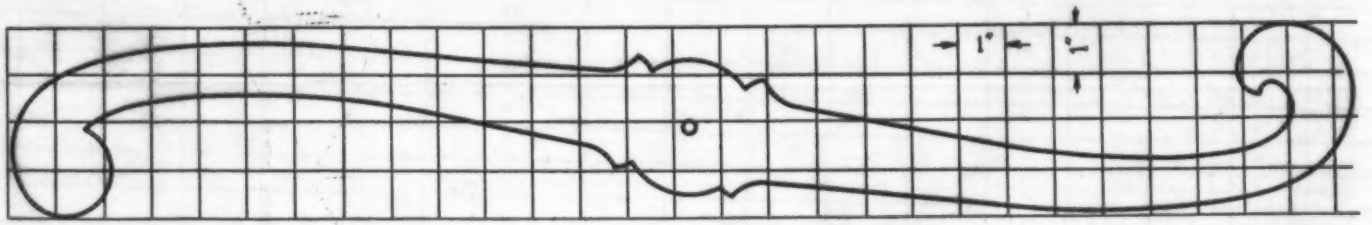
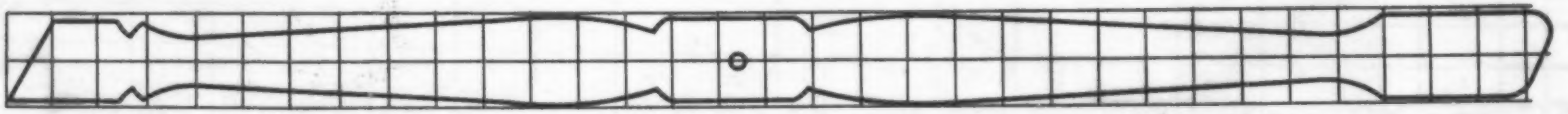
FOLDING TABLE AND LUGGAGE STAND











Designed by George G. Greene, Chicago, Illinois.

For Description See Page 469, Industrial Arts and Vocational Education, December 1930

TRACING SUPPLEMENT No. 197
INDUSTRIAL ARTS AND VOCATIONAL EDUCATION
DECEMBER, 1930

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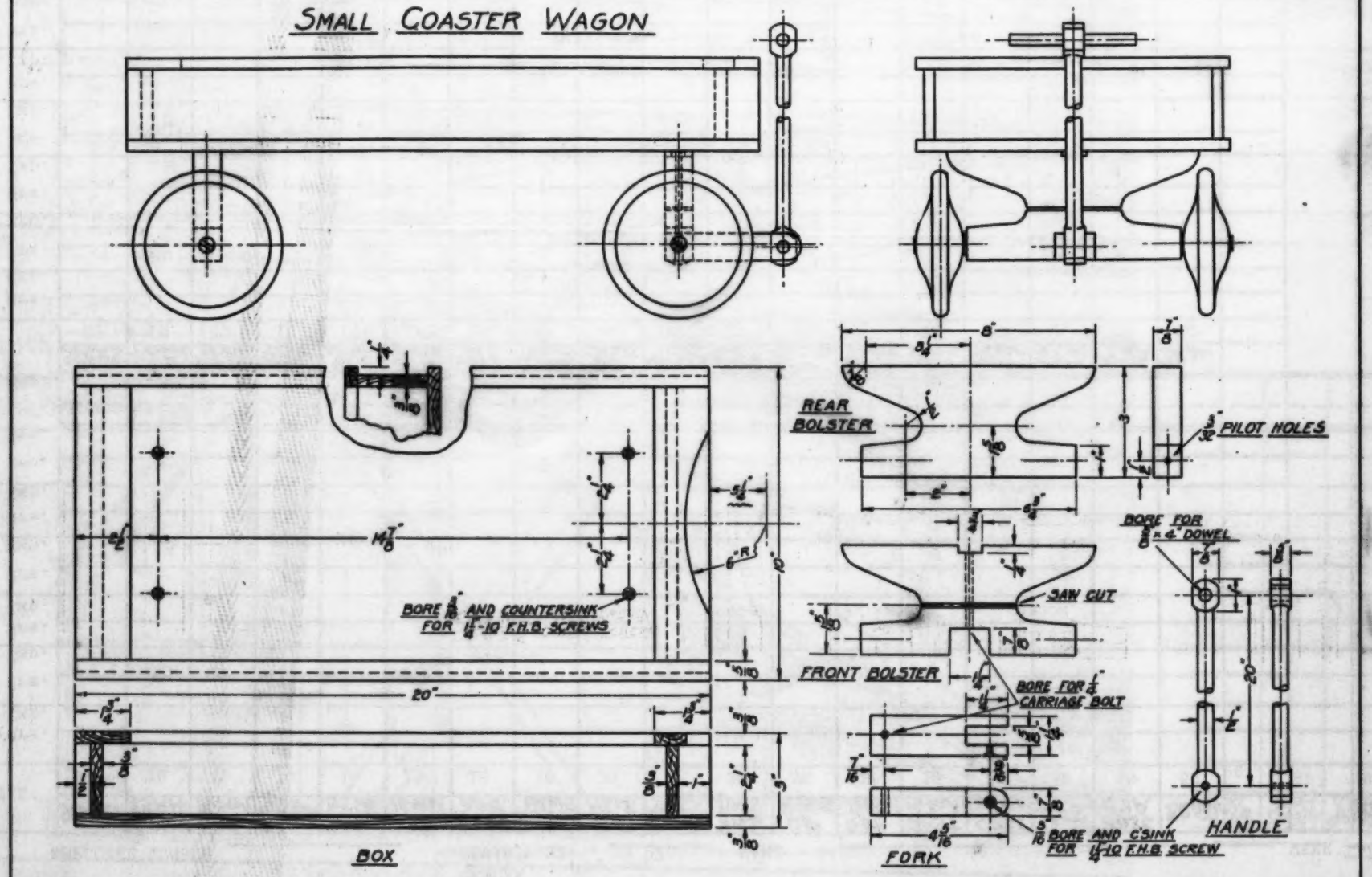
SMALL COASTER WAGON



Designed by W. A. De Vette, Erie, Pennsylvania.

For Description See Page 470, Industrial Arts and Vocational Education, December 1930

PROBLEMS AND PROJECTS

This department aims to present a wide variety of class and shop projects in the Industrial Arts and Vocational Education. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in woodworking, turning, patternmaking, machine-shop practice, sheet-metal work, forging, foundry work, auto mechanics, auto electricity, electricity, architectural and mechanical drafting, printing, bookbinding, concrete work, farm mechanics, home mechanics, and other lines of industrial-arts work are desired for consideration.

CHART OF TYPICAL PROBLEMS IN PARALLEL LINE DEVELOPMENT

C. H. Derby and J. F. Faber, Erie, Pennsylvania

(See Supplement No. 194)

The chart entitled "Typical Problems in Parallel Line Development" includes the roof collar which is a practical application of cylindrical pipe cut off on a slant. This problem also shows the method used to develop auxiliary views. In this case the auxiliary view is the hole cut in the plate to which the collar is attached. This same method is used to lay out the hole to be cut in the roof or for a flat collar to be placed around the pipe.

Elbows

The elbow is used more in sheet-metal pipe work than any other pipe fitting. The method used to develop the pattern is plainly shown, as is also a chart giving the rise per foot of the cutting line for a 3-, 4-, 5-, 6-, or 7-piece 90-deg. elbow. The slant of the cutting line may be found by the following procedure: (1) draw two lines forming the angle between the two faces of the elbow, (2) with the intersecting point as a center, draw the arc of the angle, (3) divide half the arc into one less number of equal parts than there are pieces in the elbow, (4) a line drawn from the center through the first division of the arc will be the cutting line of the elbow, (5) develop the pattern as shown.

Tees

The tee development shown in No. 1 is the most common, the branch being the same diameter as the main pipe, and the intersection of the two being at right angles. The method used to develop the pattern for the branch, as well as the hole to be cut in the main, is clearly shown by the drawing.

Tee development No. 2 shows the same method applied to another very commonly used tee, the branch being smaller in diameter than the main pipe and intersecting as No. 1 at an angle of 90 deg.

Tee development No. 3 is similar to No. 1, except that the branch and main pipe intersect at an angle other than a right angle. Combining No. 2 and No. 3, the draftsman will find it an easy problem to develop the pattern for a tee with the branch smaller than the main pipe and intersecting at an angle other than a right angle.

Tee development No. 4 might be termed an eccentric tee, for the center of the branch does not coincide with the center of the main pipe. A development of the complete intersection line of the two pipes must be made before the pattern can be developed. The development of the pattern is the same as that shown in No. 1 and No. 2.

ADJUSTABLE CHRISTMAS-TREE HOLDER

Arthur F. Ahr, Buffalo, New York

(See Supplement No. 195)

The Christmas-tree holder illustrated herewith, is a metal-working project which has met with considerable success. The simple design shown may be made more elaborate to conform with the taste and ability of the pupil. The general idea, proportion, and size will give the creative boy something basic upon which to elaborate.

This project is not only interesting, but it is useful as well, and it embodies many fundamental principles and operations in metal work. It may be finished to suit the taste of the individual student.

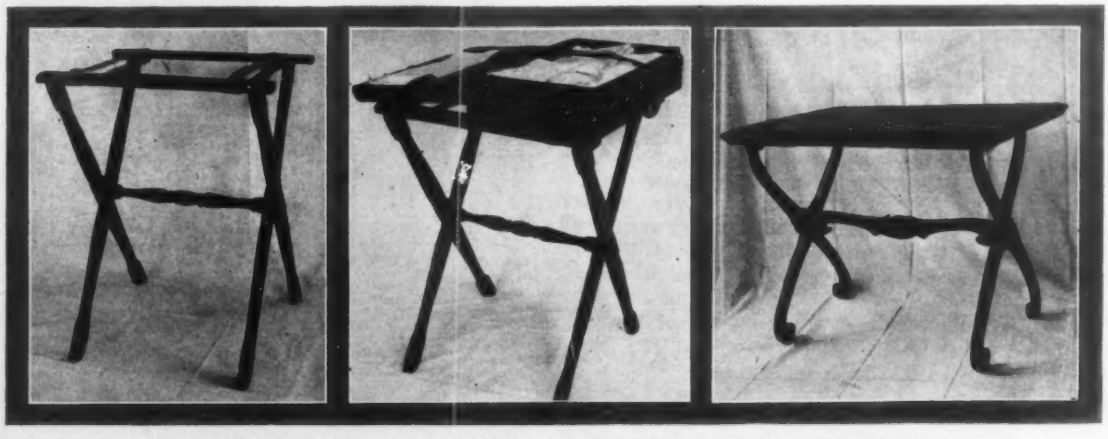
FOLDING TABLE AND LUGGAGE STAND

George G. Greene, Lane Technical High School, Chicago, Illinois

(See Supplement No. 196)

The luggage stand described herewith is intended for the spare bedroom. It saves the guest from having to open his suitcase on the bed, on a chair, or on the floor. When not in use, this stand can be folded up and placed away in a closet.

Provided with a top, it may be used as a stand or a table. If the webbing is provided with buckles, the height of the stand



FOLDING TABLE AND LUGGAGE STAND DESIGNED BY GEORGE G. GREENE

may be adjusted as desired. The table top shown in the illustration is merely laid on the trestle without any other fastening.

Alternative designs for the stretchers and legs are shown in the illustration.

SMALL COASTER WAGON

W. A. De Vette, Erie, Pennsylvania

(See Supplement No. 197)

Most plans for coaster wagons to be found are those intended for boys well into the school age. Here is one which is designed for use by the little fellow who may even wish to use it indoors.

The drawing will show that the construction is of the simplest kind, yet it is sufficiently strong to give long and hard service. The top of the box is so made that it will be comfortable either for kneeling or sitting. The wheels shown in the drawing are metal disk, with rubber tires. They may be purchased at the toy department in almost any large store. This type of wheel is used so as to eliminate all turning work, although any boy skilled on the lathe may turn up a set of wheels approximately 5 in. in diameter in a short time.

Bill of Material

1 pc.	⅜ x 10 x 20	Box
2 pc.	⅜ x 2¼ x 20	Box
2 pc.	⅜ x 5⅛ x 20	Box
2 pc.	⅜ x 2¼ x 8¾	Box
2 pc.	⅜ x 1¾ x 8¾	Box
2 pc.	⅞ x 3 x 8	Bolsters
1 pc.	⅞ x 1¼ x 4 5/16	Fork
1 pc.	⅝ x ⅞ x 20	Handle
1 pc.	⅜-in. Diam. x 4	Dowel
4	Wheels (5 in. approximate diam.)	
5	1¼ x No. 10 f.h.b. Screws	
1	¼ x 3 Carriage bolt — Kingbolt	
4	2½ x No. 12 l.h.b. Screws	
6	Washers, ¼-in. holes	
	Brads	

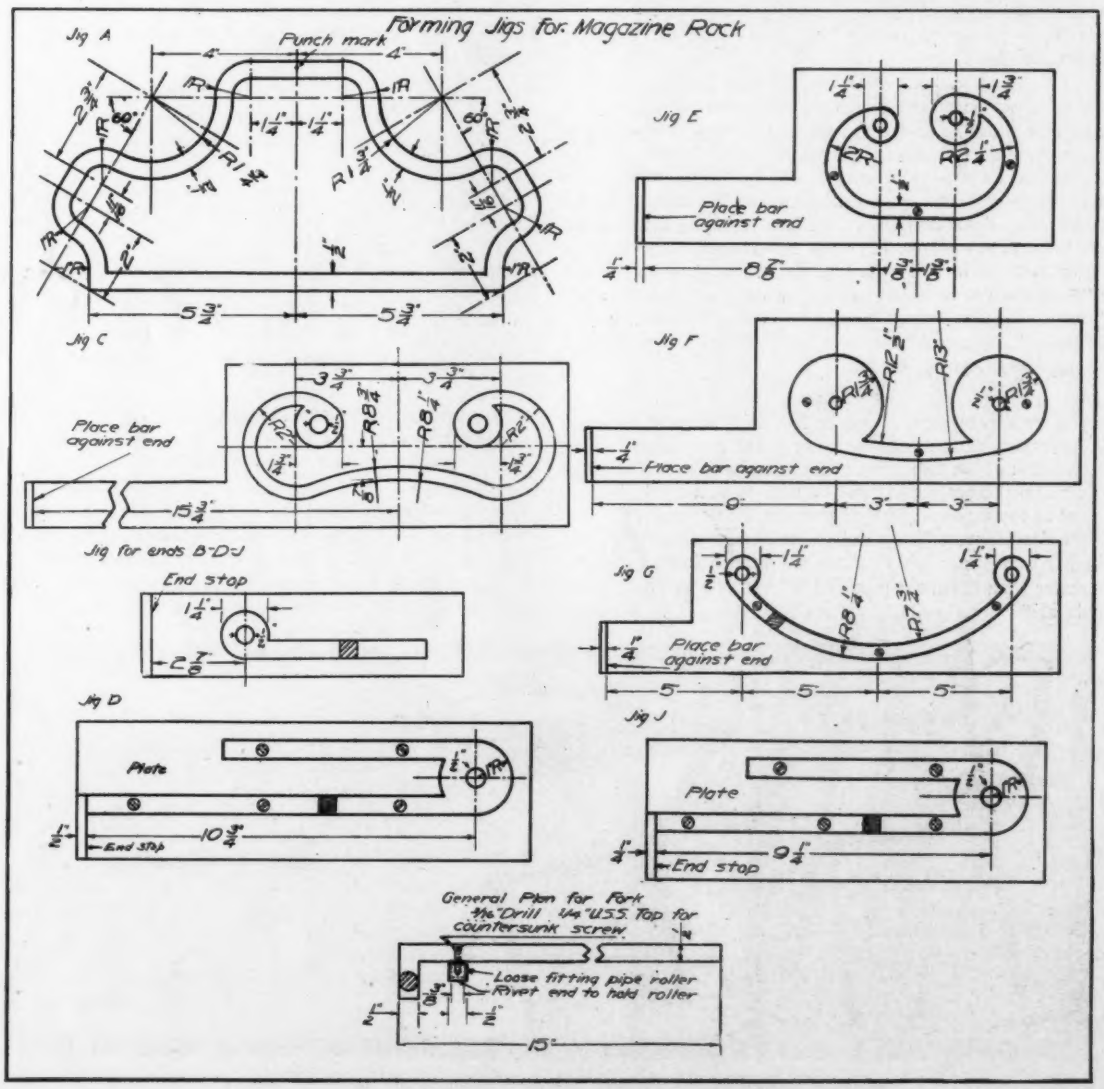
No definite order of construction need be established, as the parts are made independent of one another with the exception of the front bolster and fork which should have a very snug fit. The kingbolt should be tight in the fork and lower part and loose in the upper part of the bolster. A washer between the bolster parts and at the top under the nut will be necessary to resist excessive wear.

MAGAZINE RACK

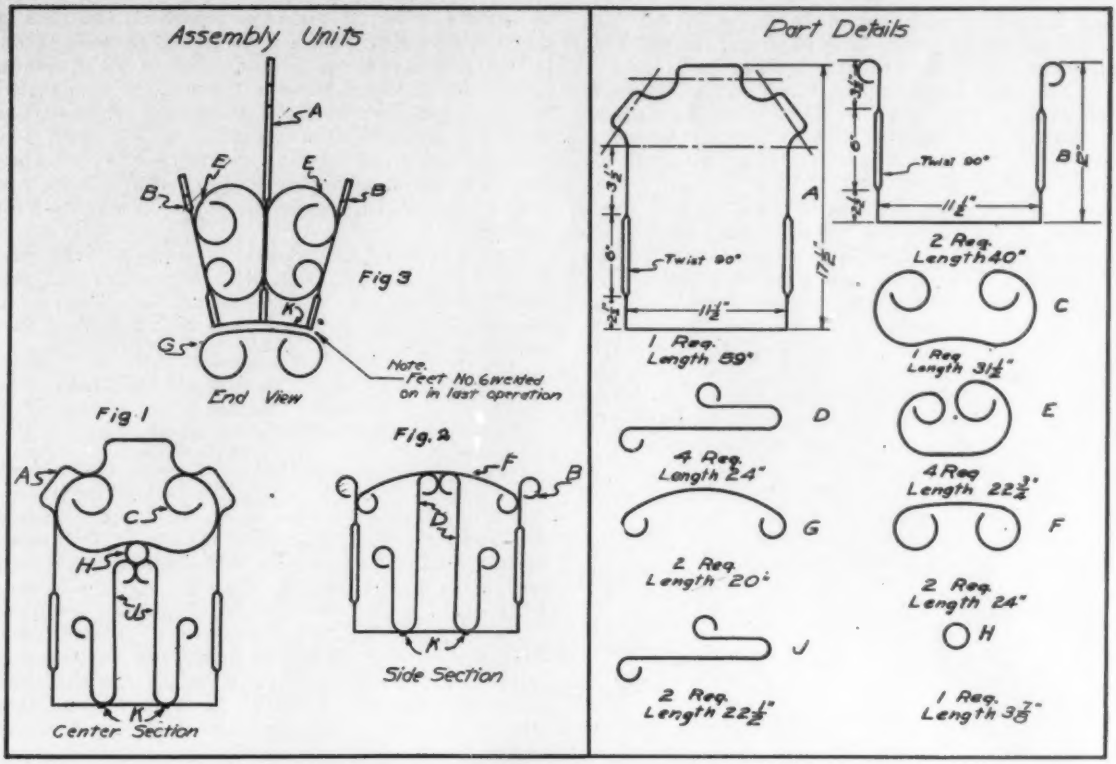
T. P. Hughes, University of Minnesota, Minneapolis, Minnesota

A Project in Metal Work for Industrial-Arts Courses

In submitting the accompanying project to industrial-arts

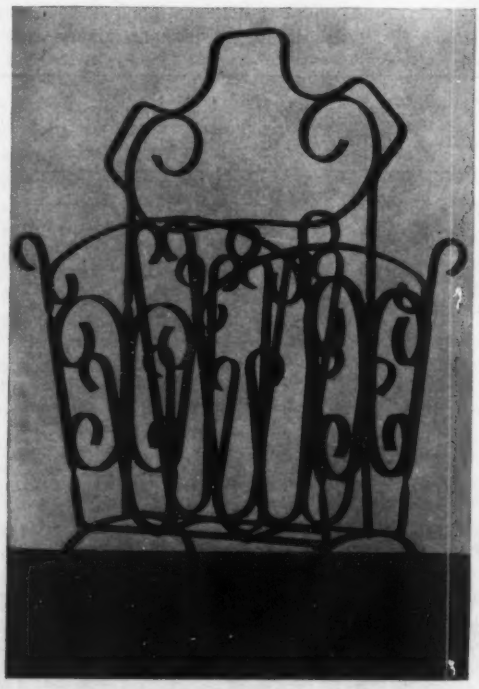


FORMING JIGS FOR THE MAGAZINE RACK



DETAILS OF THE MAGAZINE RACK

teachers in junior and senior high schools, the writer is not unaware of the distinct difference of aims which exists between their work and that offered in the shop courses of a university. However, the project described herewith, will, it is believed, function equally well in the partial satisfaction of both sets of aims.



THE MAGAZINE RACK
This cut appeared on Page 401 of the October issue of Industrial Arts and Vocational Education.

Since all students required to pursue shop courses at this university study the technique and applications of modern welding methods as a part of the course in forging, this project is utilized to furnish a laboratory problem in oxyacetylene welding in addition to its other functions. However, in schools where welding is not a part of the offering, the fastenings may be made with rivets.

Where riveting is to be used, it is recommended that part H, Figure 2, be omitted and that part D which is longer than J by an amount equal to the outside diameter of the ring H, be substituted for J.

The shop instructor will appreciate the advantage of drilling some of the parts before they are bent and that others may be drilled just as advantageously after bending. Provided the lengths of the parts and the bending operations are checked, undoubtedly a higher instructional value will be realized if a complete magazine rack were made by the instructor, disassembled, the parts straightened carefully, and then have the part name, center distances of the holes, and exact length stamped on so that the parts may then be used as master parts or patterns. If desired, certain parts of these patterns may be casehardened.

The bending jigs for this project will have to be made by the instructor, unless a capable advanced student is available. The products can then be made by the pupils either as an individual problem, or the work may be conducted on production lines, assigning certain parts to groups within the class. The bending jigs are made of ½ by ½-in. soft steel bent to the various shapes, and where necessary welded to disks of the same thickness and of the required diameters. If desired, the ends of the bar may be looped, and in order to provide a better bearing surface for the bending fork a piece of pipe ½ in. long may be inserted in the loop as a bushing. The jigs are held down on a wooden table or bench having a sheet-iron top, or they may be mounted on steel plates to which may be attached a stem to fit into sheet-metal stake holes, or into the square hole found in the face of the anvil.

Both ends of parts B, D, and J are looped while the bars are straight. To determine the correct length, the looped ends

of parts D and J are placed against the stops of the respective jigs, and held with a pair of tongs to prevent slipping. They are then given the U shape with the bending fork.

The right-angle bends on part B may be made in a machinist's vise. The 90-deg. twist is made by holding the piece in a vise, the twist being put on with a suitable wrench. A distance of ¼ in. should separate the wrench from the vise to avoid shearing the bar.

Part A is bent on Jig A, beginning at the top, first placing the center of the bar opposite a punch mark located on the center line of the jig. The bar is then fastened firmly in this position with a C clamp. The rest of the bar is bent to shape by means of a pair of tongs, carefully following the contour of the jig. After both sides are thus made to conform to the jig, the right-angle bends and the twists are made just as they were for part B.

The manner of assembling the parts can best be determined by the individual instructor. It must naturally be based on the available shop equipment. It is suggested that, in general, the order shown in Figures 1, 2, and 3 be followed. Part K is welded, or riveted across the bottom as shown in Figures 1, 2, and 3, and may be attached as the last part.

The following constitutes a bill of materials:

Stock: ⅛ by ½-in. soft steel hot finished

No. of pieces required	*Length (inches)*
1	59
2	20
*4	24
1	31½
2	40
4	22½
2	24
†2	22½
†1	3⅞
2	6

*6 if riveting is used.
†Required if welding is used.

WROUGHT-IRON TABLE

R. B. Newhauser, Supervisor of Industrial Arts, Shorewood Public Schools, Milwaukee, Wisconsin

The wrought-iron table in its various forms always makes an attractive problem in ornamental ironwork and provides an opportunity for the student to express his own ideas in design, besides giving him a thorough understanding of the process involved in its construction, especially that of welding.

The table illustrated herewith is constructed of mild steel and the various joints are welded together by the oxyacetylene flame. The three uprights on each end are made of ½ by ½-in. square mild steel and are twisted cold inside of a pipe to prevent them from buckling. The frame for the top is made of 1 by 1 by ⅛-in. angle iron, the corners being notched out and welded.

The top preferably should be made of marble which must be fitted into the upper frame after the frame has been completed. The finish may be either the natural iron or any of the various enamel or lacquer colors according to the taste of the builder.

SHEET-METAL WORK FOR INDUSTRIAL-ARTS COURSES

Russell B. Williams, Chicago, Illinois

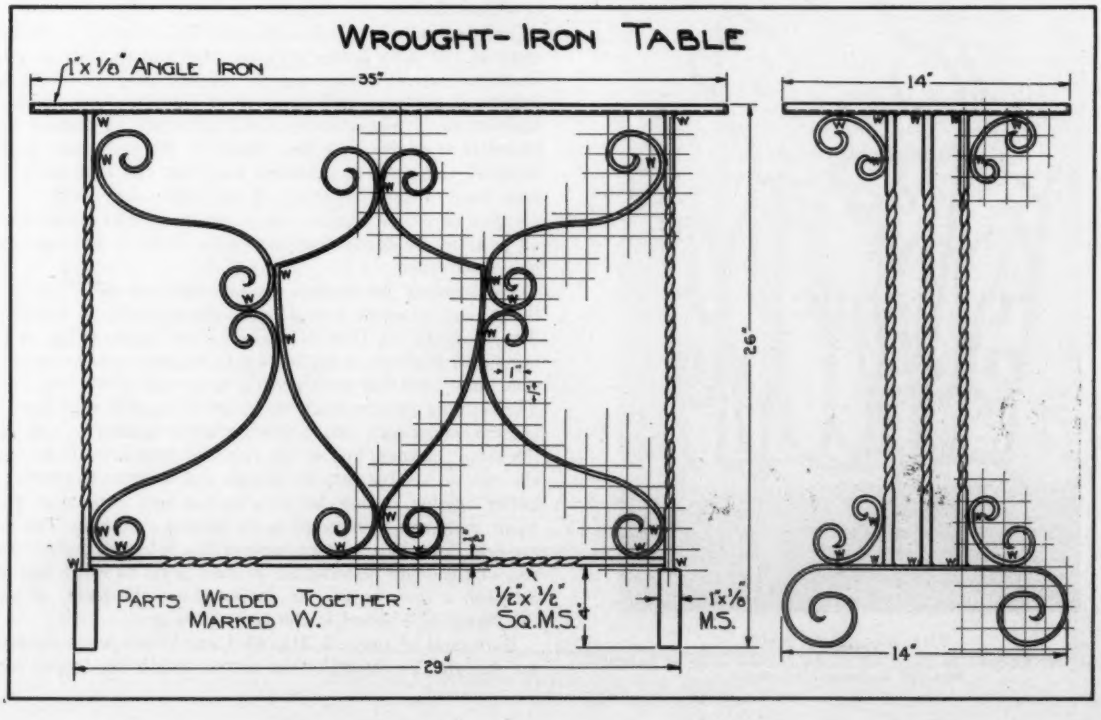
Perhaps the most important factor in introducing sheet-metal problems of the type described herewith, is the fact that they offer unlimited opportunities in bringing out the natural genius of the brighter students of the class, and that they enable the instructor to make a most excellent showing with the work of even those students who are clumsy with tools, and who find difficulty in performing the simplest operations.

The examples shown in the illustration are extremely interesting to the average student. They consist of articles that he will be proud to take home; and better still, the objects are so ornamental and useful that the parents will not put them away in the attic or some dark closet after they have been brought home.

The projects described are not intended to constitute a complete industrial-arts course, but merely to give an idea of the possibilities of this type of work. The brighter boys in the class will wish to display their creative genius by designing articles for their own particular use, and those with little or no ability at design, will be perfectly contented in using the various designs as templates for making their articles.

The articles shown in the illustration may be classified as follows: signs, toys, animal cut-outs, and things for the house.

Signs such as the child and mother at play offer an unusual opportunity for the student to display his ability in strict



EXAMPLES OF SHEET-METAL WORK

artistic design. These metal silhouettes are becoming more and more popular for signs for tea houses, road stands, and shops. Students who wish to earn pin money find them extremely easy to sell.

The office sign needs no comment, and the arrow sign, for school purposes, shows strangers the direction to the baseball or football field. It is also a useful marker for the golf course.

The animal cut-outs — the camel, the stag, the elephant, and the sea otter — as strictly cut-outs, can be used to good advantage as templates in the kindergarten and primary grades for making simple outlines for coloring. They are easy to make, and the older students enjoy cutting them out.

The rooster is an example of the possibilities of making moving toys. Such toys are a pleasure to make and are nice Christmas presents for a little brother or sister. The rooster flaps his wings and moves his head up and down in a realistic manner, as if crowing. The wings operate by a cord and go down when the head goes up. The wings must be counterbalanced with a spring, as they would otherwise be so heavy that the hind wheels would drag. The head operates from a crank on the hind wheels. The rooster is painted a brilliant red, with black markings and with gilt eyes. The wheels should have rubber tires to prevent marring the floor. Such tires can be made from split rubber tubing, using a little rubber cement to join the ends together.

The animal cut-outs also form useful articles for the house. The little elephant, for example, may be placed on a base, so as to make a novel and interesting book end, which may be made of copper, brass, or even sheet iron. If made of sheet iron, gray paint can be used for the body with a red-and-gold blanket.

The sea otter is mounted on a wooden base for display purposes. Its use is that of a foot scraper to be mounted on the steps. For wooden steps, the base is bent over and holes are drilled for screws. For new cement steps, it is not necessary to bend the base, as it can be simply set in the wet cement.

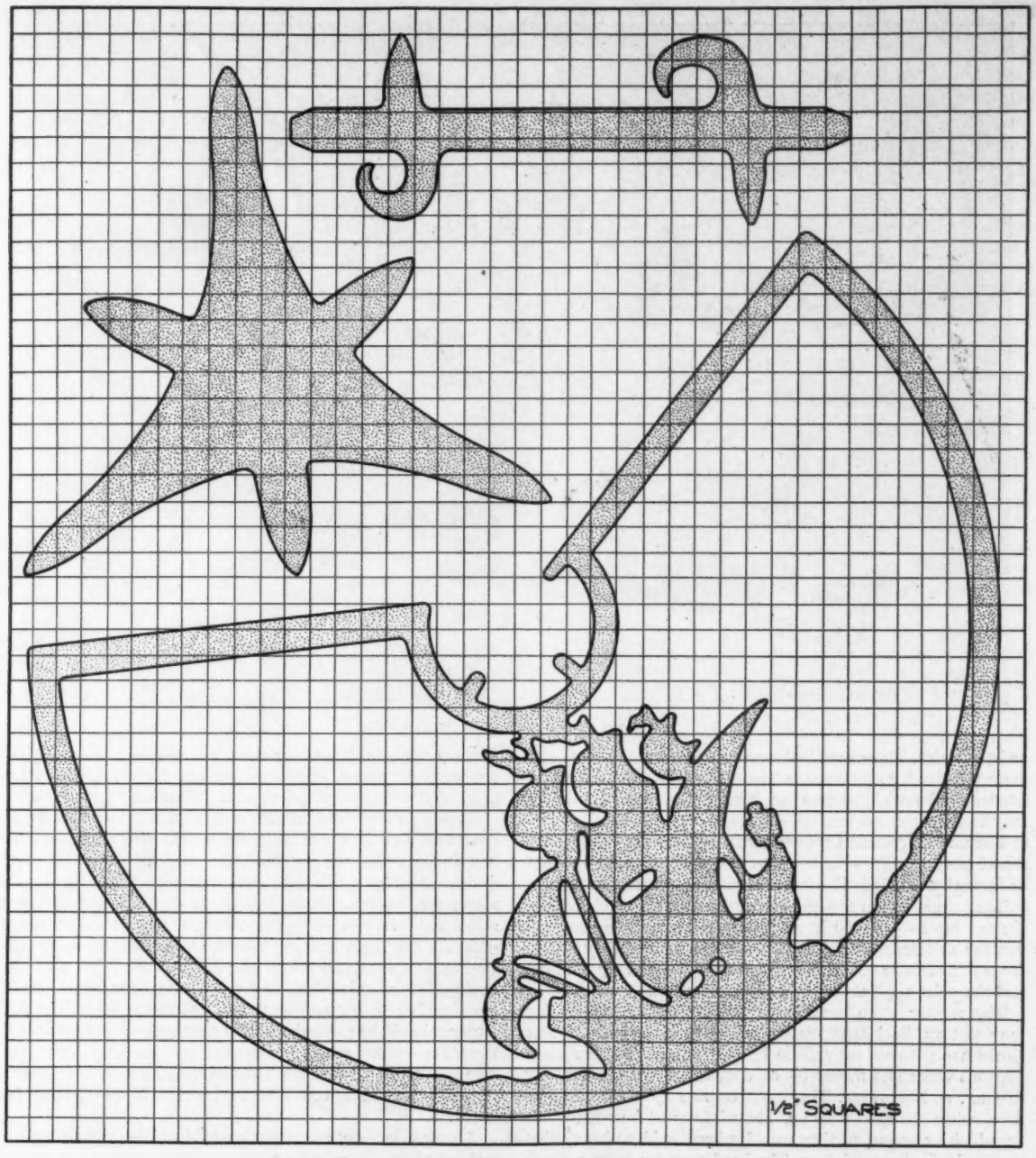
The stag, when properly mounted, makes a very artistic weather vane. Such weather vanes can also be made using the rooster, cow, arrow, and other cut-out designs; in fact, the number of weather-vane designs is almost unlimited.

Among the other useful articles shown are the colonial wall lamp, the bird brackets, plant pot holder and plant pot, the hall lantern, the wall brackets, the smoking tray, the swan-design magazine rack, and the necktie rack which is directly above the lantern. These articles are first cut out of sheet metal and then riveted together. Putting them together is not difficult. The plant pot and holder, the hall lantern, the wall brackets, and the magazine stand are made of sheet iron, about 1/16 in. thick. The feet of the magazine stand should have rubber pads to prevent scratching the floor. The hall lantern should be painted black to represent wrought iron, but the other articles may be painted to suit the individual taste. The smoking tray and the colonial wall lamp are of bronze, although the lamp could be made of iron and painted or bronzed.

A course in sheet-metal work would not be complete without including hinges and ornaments for a boy's strong box or treasure chest. Every boy wants a chest of this sort, so that he can lock up his useful whatnots. The box itself is of wood. The hinges and ornaments may be of bronze or of sheet iron. Both are equally good, depending upon the finish of the box. The box shown in the illustration is black with bronze hinges and has a very pleasing appearance.

One of the most interesting articles shown, is the little boat lamp shade and the lamp to match. Hanging on the wall, directly under the office sign is a metal cut-out of the shade. At its right is the cut-out for the standard, and at its left is the cut-out for the base. This lamp is so popular that we are including an illustration to give the general dimensions of the three parts. The design is laid out on ½-in. squares, so that it will be easy to duplicate.

In making the lamp, two holes are drilled in the base for riveting the standard, and one larger hole is drilled in the top part for mounting the electric fixture. A series of holes are



HOW TO LAY OUT THE COMPONENT PARTS OF THE LAMP

drilled along one side of the shade for riveting together. Then the base, standard, and shade are peened with an ordinary peen hammer.

The base legs are curled over and the ornamental spurs are curled up. The ornamental spurs on the standard are curled and the standard is given one complete twist. The tips on the top of the shade are bent over and the lamp is riveted together.

The lamp should be finished in a wrought-iron black. To finish the shade, place a piece of lamp-shade parchment paper under the metal frame. This may be held in place by the fixture, which can be obtained at any electrical store. The electric cord winds up around the standard.

The little boat used in the lamp shade is also an excellent design for many useful household articles. One of the most beautiful fireplace screens that the writer ever saw, had three of these little boats fastened to the wire screen. They were finished in bronze, although made of sheet iron. The boat, like the little elephant, may be used in the making of artistic book ends. Two of these boats mounted about 2 in. apart, U-shaped looking at them from the ends, are useful as a letter and correspondence file.

The possible designs for useful household articles are almost unlimited. Among other designs are: holders for fireplace tools, andiron ends, bridge lamps, frames for electric toasters, door hinges, clock bases, banjo-clock frames, and many others.

Almost all of the articles described can, of course, be cut out by hand methods, using drills and metal coping saws. Such methods are slow and laborious. They are difficult for the slow pupil and require all of the skill of the apt student. This is probably why such work is not being done in a great many schools.

However, designs of this type may be quickly and accurately cut out on a nibbling machine, which makes cutting to the line much less difficult than if it is done with a coping

saw. Another real advantage of this machine is that the slower students can use the original cut-outs of the brighter student as a template for making his own pieces. The machine then enables him to do such a perfect job that he may muster up sufficient courage and energy to overcome his own backwardness.

TYPICAL JOB SHEET FOR THE ELECTRIC SHOP

Ralph W. Shimer, Bethlehem, Pennsylvania

Object

The object of this job is to determine by test, the distribution of current, voltage, and resistance throughout a series circuit.

Discussion

Consider the circuit shown at No. 1. If five amperes flow through the first coil, how many amperes flow through the second one? How does the current through one part of the circuit compare with the current through any other part of it?

If the voltage across the first coil is thirty volts, is it the same thing across the other coils? How does the sum of the voltages across the individual coils compare with the voltage across the line?

How does the sum of the resistances of the three coils compare with the resistance of the entire circuit?

The answers to these questions are to be found from the results of a test that you will run.

References:

Rowland's *Electricity for Practical Men*, chapter I, paragraphs 9, 10, and 11; chapter II, paragraph 15.

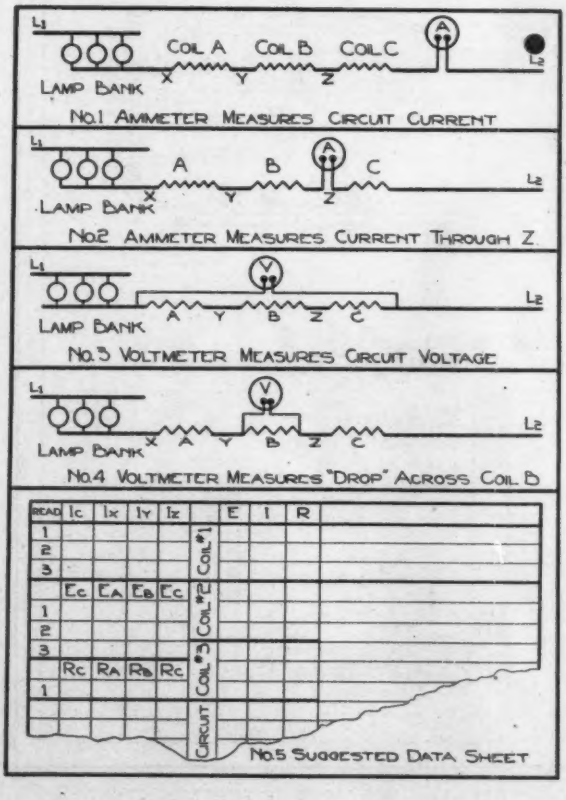
Swoope's Lessons, chapter X, page 122, chapter VIII, pages 104 and 105.

Jones's *Essentials of Applied Electricity*, pages 96 to 99.

Material: d.c. ammeter, d.c. voltmeter, lamp-bank resistance board and tools.

Shop Practice

Select three resistance coils, two of which are wound with the same size wire and connect them in series with each other across the 220-volt d.c. Use a bank of lamps in the circuit as shown to adjust the current.



Prepare a data sheet as shown in the illustration. The instructor will explain the meanings of the symbols used.

Connect the ammeter to read the circuit current. Read and record.

Change the ammeter to measure the current flowing through the first coil, then the second coil, and then the third coil. Read and record the readings each time the meter is changed to a different position.

Change the current through the circuit by adjusting the lamp bank and repeat all the readings that were taken with the first current setting.

Again change the current setting and again repeat the readings.

Show your data to the instructor to be checked.

Connect a voltmeter across the first coil, across the second, and then across the third coil, reading and recording each reading in the proper place on the data sheet.

Read and record the line voltages (remember that the lamp bank is not a part of the circuit under test and should not be used in this measurement).

Change the voltage across the circuit by adjusting the lamp bank and repeat the readings.

Again change the line voltage and repeat the readings.

Show your data to the instructor to be checked.

Measure the resistance of each coil separately and when the three are connected in series. Take as many readings as are necessary to insure accuracy. Calculate the resistances and record them on the data sheet.

Show your data to the instructor to be checked.

Examine your first section of data. How does the current through one part of this circuit compare with the current through any other part of it?

How does the sum of the voltages across the parts of a series circuit compare with the voltage across the entire circuit?

How does the sum of the resistance in a series circuit compare with the resistance of the entire circuit?

Does the voltage across a part of the circuit seem to be dependent upon the resistance of that part of the circuit?

Report

Sheet No. 1. Cover sheet.

Sheet No. 2. Data sheet.

Sheet No. 3. Diagrams of connections illustrating the three laws arrived at through this test.

Sheet No. 4. Answers to questions and problems 1, 2, 8, 10, and 12, chapter I, and problems 1, 2, 3, 5, 7, 10, 11, 12, and 14, chapter II in Rowland's *Electricity for Practical Men*.

JUNIOR-HIGH-SCHOOL DRAFTING

W. H. Bowers, Edison Junior High School, Harrisburg, Pennsylvania

A boy, immediately upon entering the junior high school in the seventh grade, begins to come in contact with the different industrial departments: Woodwork, electricity, sheet metal, printing, auto mechanics, and perhaps the machine shop.

A universal language is made use of in these departments which might be called "The Language of Industry." It has its own grammar, rules, and abbreviations; its study enables one to express thoughts hitherto impossible; it consists of different views of an object arranged according to a definite system, with lines and figures added to tell sizes. This universal language is mechanical drawing.

In order to work intelligently, many tradesmen must understand and read drawings or blue prints because all the information necessary to construct the object upon which they are working is conveyed to them through the medium of drawings, or blue prints.

The student should begin his mechanical drawing in the seventh grade, and be compelled to "carry on" this work, throughout his junior-high-school career. At least one period a week (sixty minutes) should be devoted to this work. Mechanical drawing should be compulsory for every boy, so

as to prepare him to meet the conditions and standards of his future environment.

The following is a suggested outline of the objectives and content of a course of study suitable for a junior high school.

General Objectives: To teach the fundamental of drafting; to teach the making and reading of simple working drawings; to develop technique.

Grade 7–B

Objective: To teach the fundamentals of drafting.

Content: Lettering; free-hand sketching and principles of orthographic projection; dimensioning; use of instruments; layout of border lines and titles space; centering and blocking in the views.

No required amount of work is stressed during this semester.

Grade 7–A

Objective: To teach the fundamentals of drafting including the making of a few simple working drawings.

Content: Straight-line objects generally rectangular in shape with surfaces at right angles to each other; no available edges and of a size that can be drawn full scale.

Required Work: Four drawings approximately, per semester.

Grade 8–B

Objective: To teach the fundamentals of drafting including the making of additional working drawings. Some stress is laid on technique.

Content: (*a*) Straight-line objects generally rectangular in shape but requiring reduced scale. (*b*) Straight-line objects generally rectangular in shape with some invisible edges. (*c*) Straight-line objects generally rectangular in shape, but having some oblique surfaces.

Required Work: Nine drawings approximately, per semester.

Grade 8–A

Objective: To teach the fundamentals of drafting including the making of additional working drawings. Some stress is laid on technique.

Content: (*a*) Simple circular objects. (*b*) Simple geometrical solids with developments. (*c*) Miscellaneous objects of greater complexity.

Required Work: Nine drawings approximately, per semester.

Grade 9–B

Objective: To teach the fundamentals of drafting including the making of additional working drawings. Stress is laid on technique.

Content: (*a*) Objects requiring simple arcs or circles. (*b*) Simple sections. (*c*) More complex geometrical solids with developments.

Required Work: Nine drawings approximately, per semester.

Grade 9–A

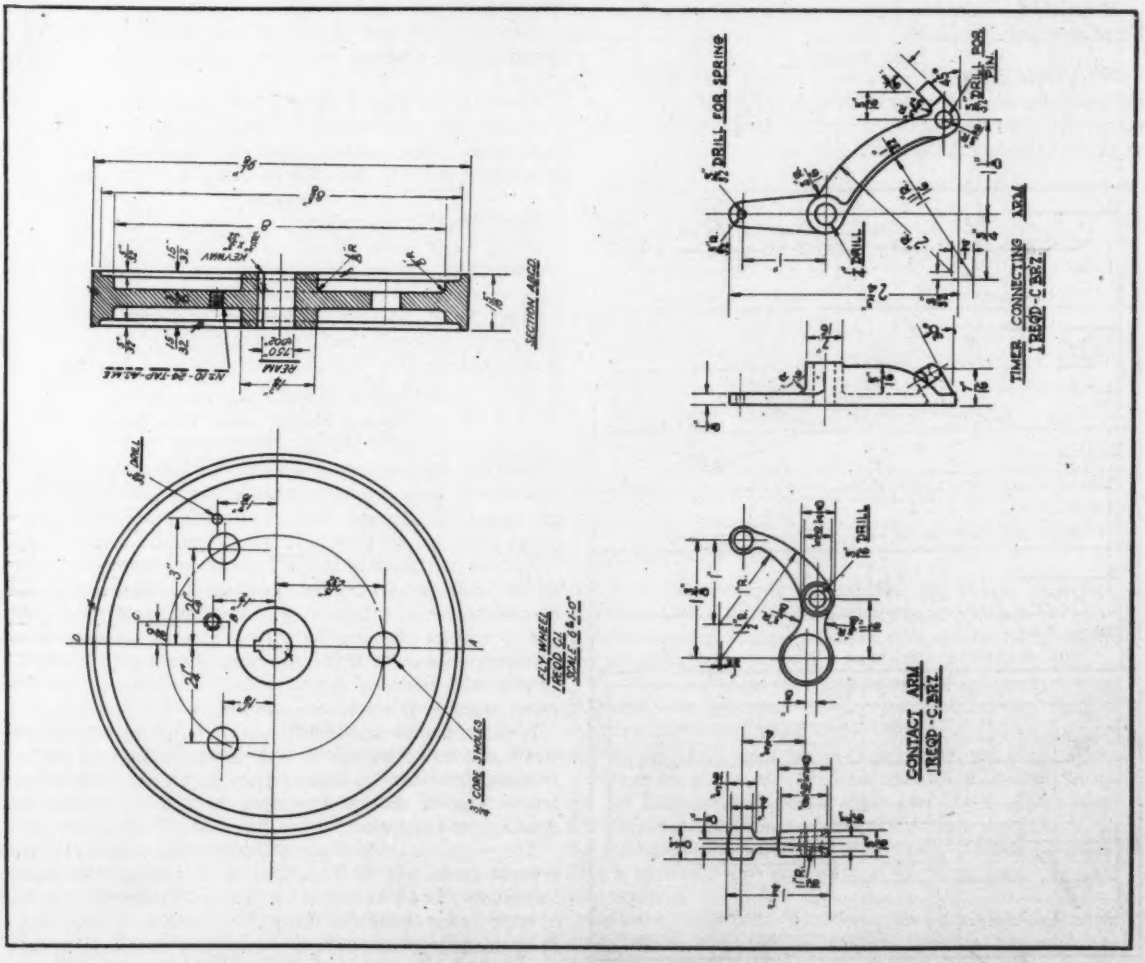
Objective: To teach the fundamentals of drafting including the making of additional work drawings. Stress laid on technique.

Content: (a) Simple assemblies. (*b*) More complex assemblies. (*c*) Miscellaneous objects of greater complexity including the detailing and assembly of a simple machine.

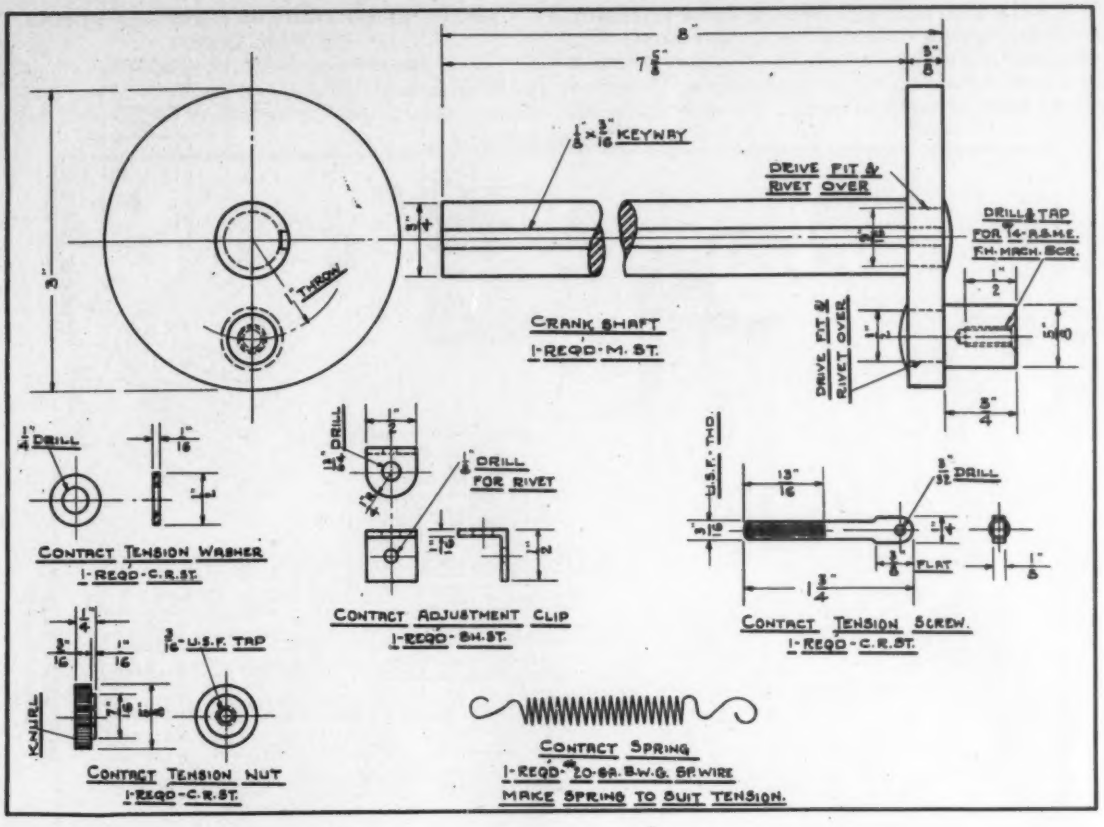
Required Work: Nine drawings, per semester.

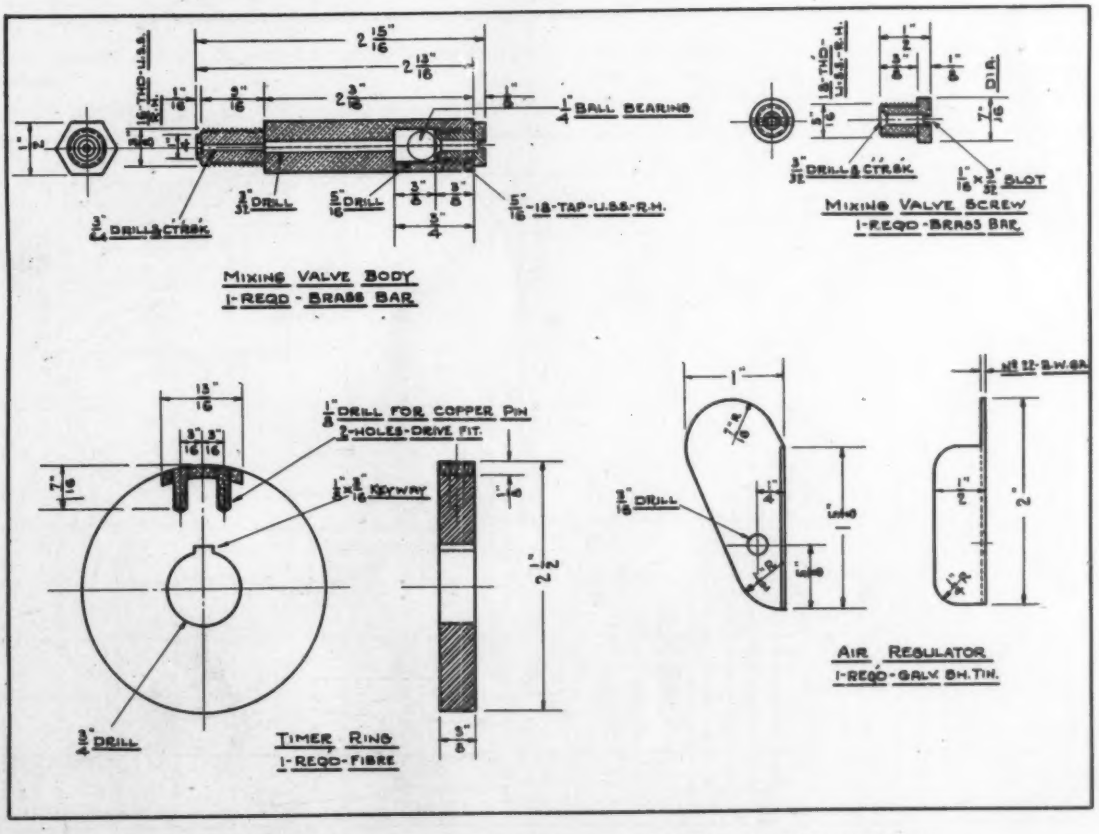
Supplement: Conventions; inking; cover design; additional projects of varying complexity.

The above outline is based on one period per week.

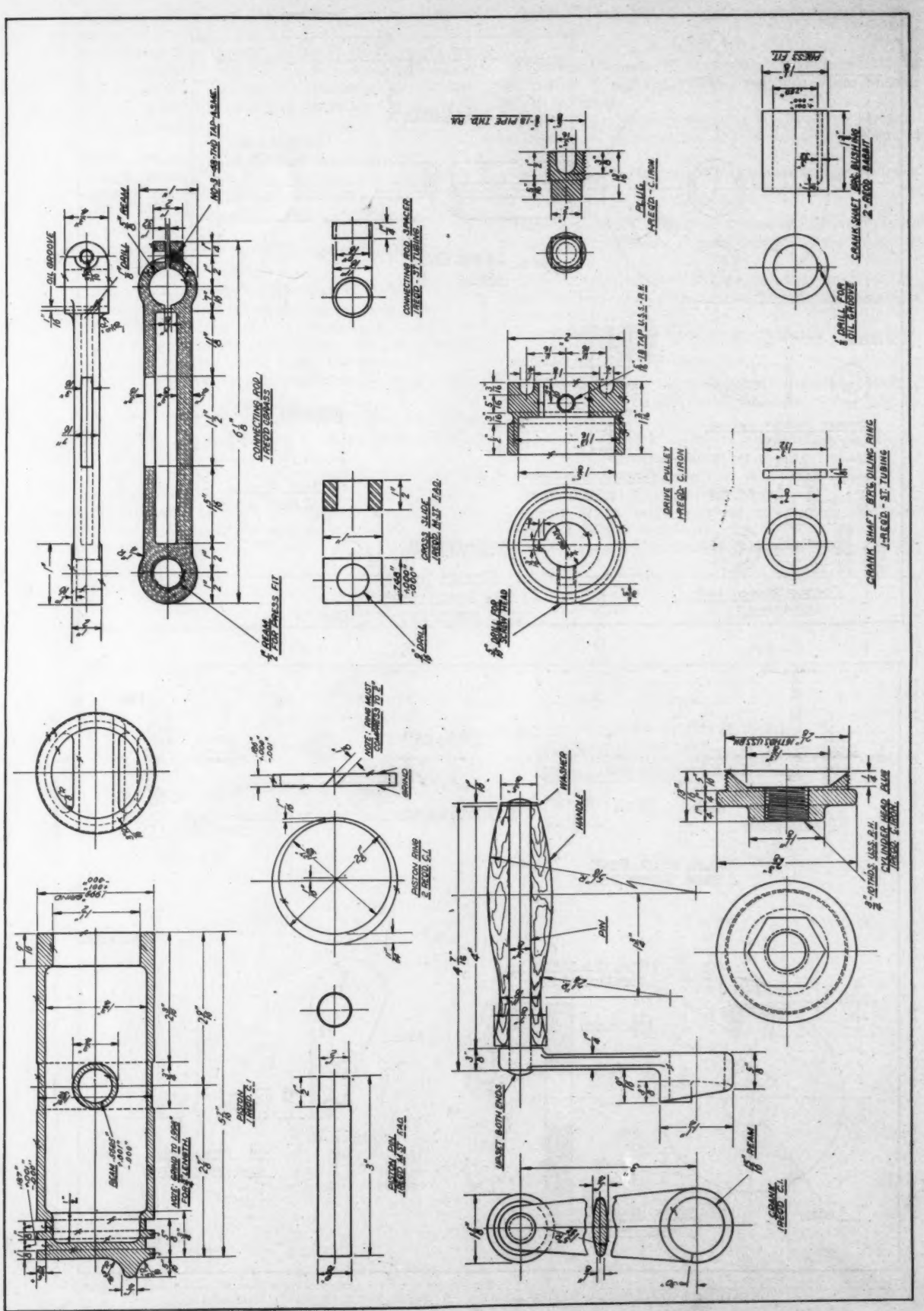


DETAILS FOR ½ H.P. GAS ENGINE DESCRIBED IN THE NOVEMBER, 1930, ISSUE OF THIS MAGAZINE
C. H. Niemann, Hammond, Indiana





DETAILS OF GAS ENGINE DESIGNED BY C. H. NIEMANN, HAMMOND, INDIANA



DETAILS FOR GAS ENGINE DESIGNED BY C. H. NIEMANN, HAMMOND, INDIANA

EXPEDITING THE PREPARATION OF STOCK FOR CLASSWORK

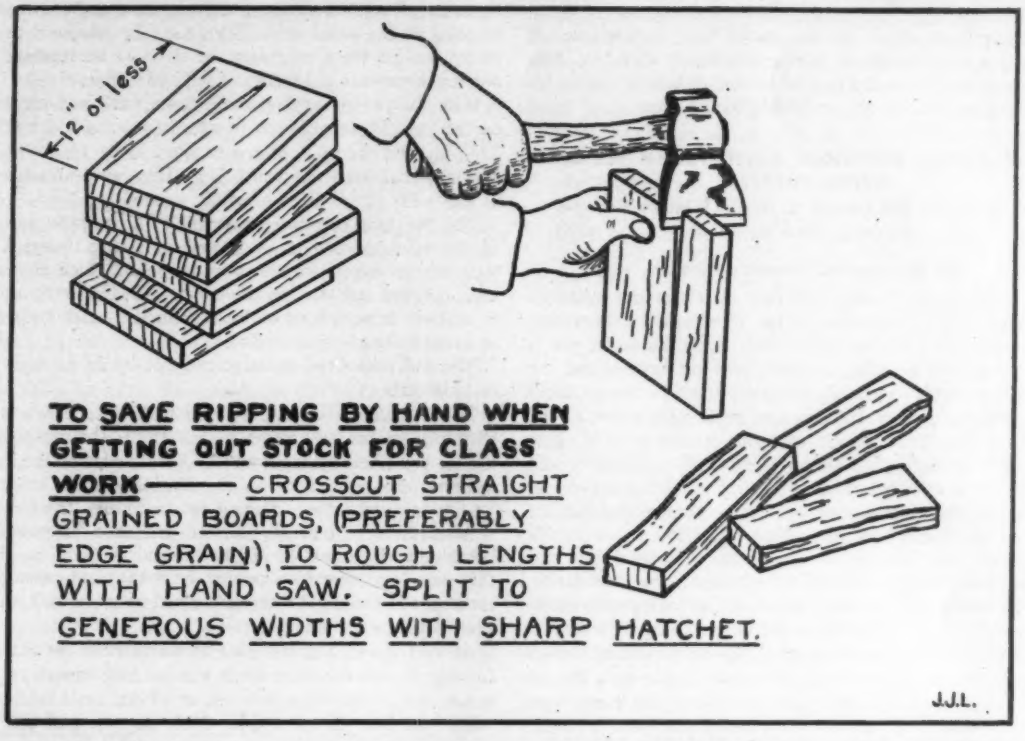
Jos. J. Lukowitz, Milwaukee, Wisconsin

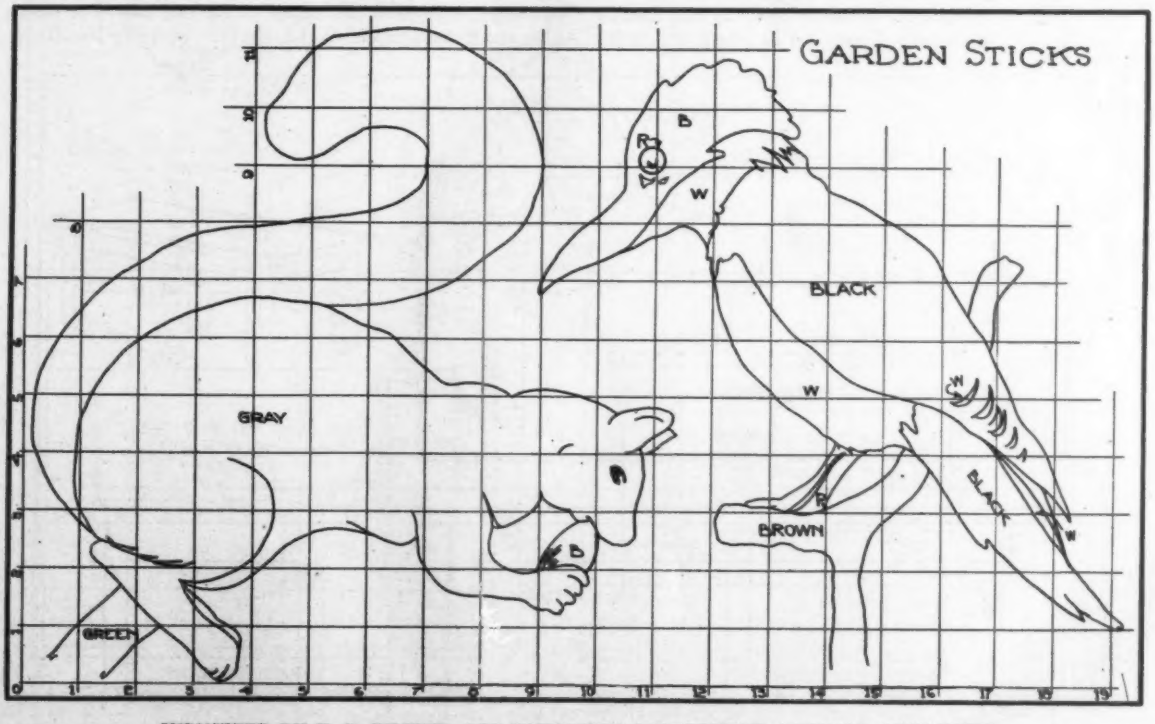
Under certain conditions it is desirable, particularly in beginning shopwork, to do classwork. This, of course, entails a great amount of labor in getting stock ready for the class or classes.

If no circular saw is available, a very great amount of handsawing will be necessary to get this material ready.

Of course, every school woodworking shop ought to have a circular saw, if for no other reason than to assist the instructor in the preparation of the stock where large quantities of the same size are needed. However, those who have no circular saw will perforce have to get along without one.

The method illustrated in the accompanying illustration shows how more than half of the labor of cutting stock by


12" or less
TO SAVE RIPPING BY HAND WHEN GETTING OUT STOCK FOR CLASS WORK —— CROSSCUT STRAIGHT GRAINED BOARDS, (PREFERABLY EDGE GRAIN), TO ROUGH LENGTHS WITH HAND SAW. SPLIT TO GENEROUS WIDTHS WITH SHARP HATCHET.
J.J.L.



SUBMITTED BY H. B. WRIGHT, ART EDUCATION DEPARTMENT, BUFFALO, NEW YORK

hand may be saved. Most classwork requires short pieces of stock, hence it is always possible to split the pieces to rough widths with a hatchet. It is, of course, important to select straight-grained stock if splitting is to be done. Since it is the boy's business to learn how to square up stock, the unevenness of the edges produced by this method, does not matter.

Naturally it is best if the instructor does the splitting. A hatchet is a very dangerous tool in the hands of a boy. For that reason too, when the hatchet is not in use, it should be kept in a place that is not accessible to the boys.

CORRELATING THE SHOP WITH OTHER SCHOOL DEPARTMENTS

Leon H. Baxter and George A. Boyce, Western Reserve Academy, Hudson, Ohio

The Mathematics Teacher's Problem

The mathematics teacher felt that his classroom ought to be a cross between a workshop, a laboratory, and a classroom. He pictured his room equipped with large tables on which simple laboratory apparatus, scales, drawing boards, and the like could be used, so that mathematics could be more closely tied up with real things. He also saw, in his mind's eye, a type of furniture that could be moved about readily so as to allow for changes in the seating arrangement. This flexibility would make it very easy to take care of a group which needed special help, as the instructor would just gather them about himself while the rest would be busy at other things.

It was not very difficult to interest the shop teacher in this idea, and after permission was obtained from the headmaster, work was commenced at once. A number of tables were examined in order to determine upon the best method of construction. Then a working plan was drawn up which permitted boys from each of the different classes to participate each day on the project. In this way, about fifteen boys varying in age from 12 to 18, contributed their bit. This meant that quite a sizable group had intimate experience with a piece of work which combined individual and coöperative enterprise. Furthermore, the boys really enjoyed the work and the number of types of work and the problems to be solved was surprisingly great.

First of all, the boys had to do much measuring and figuring to make a table of suitable dimensions in length and width for a group of six or eight youngsters. The most comfortable height for a table was determined. Methods of bracing and reënforcing to insure extreme stability and durability were studied.

After some discussion it was decided to cover the top with linoleum. It made the construction easier since the top could be made of soft wood which did not have to be so carefully finished as the usual desk. Then too, the linoleum could be easily washed when necessary, or it could be replaced without much expense if that was found advisable.

With the preliminary planning done, work was commenced on the legs. These were cut to size, four being 3½ by 3½ by 28⅜ in., and the fifth, or center leg, 3½ by 3½ by 27½ in. The material used was white pine. Legs were accurately cut to size with all surfaces carefully sanded.

The two long rails were next made. These rails were made of 1¼-in. stock, 5½ in. wide, and 6 ft. 10 in. long. A tenon was cut, as shown on the drawing, ¾ in. thick and 1½ in. long, notched out 1 in. on the lower edge. Care was necessary in making these tenons to have them square shouldered and of even thickness. (See sketch C.)

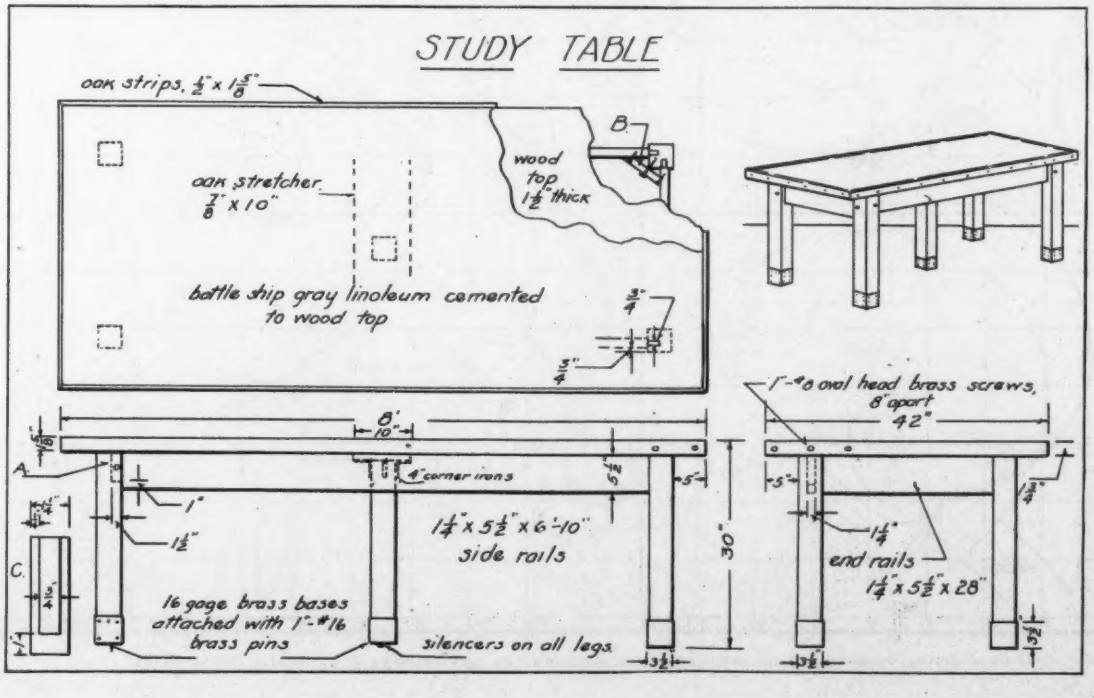
The end rails were similarly cut, 5½ by 28 in. with tenons on both ends.

The mortise in the legs to receive these tenons was bored with a ¾-in. bit, to a depth of 1 9/16 in., the center line for the bit holes being 1 in. from the outside edge of the leg, thus bringing the rails closer to the outside surface of the legs. The mortise was then chiseled out to receive the tenon.

All rails were carefully sanded and then assembled with hot glue and clamps. It will be noticed at A on the drawing that the legs were also pinned in with ¼-in. wooden pins through the tenons. These were glued in place and smoothed even with the leg surface.

At B is shown a cross brace at the corners, for extra reënforcing. A piece of ⅞-in. stock was cut long enough to stretch across the corner, with ends cut at 45 deg., and held in place with four No. 10 by 1½-in. f.h.b. screws, and one ⅜ by 2½-in. lag bolt.

Next, a piece of wood ⅞ by 10 in. was cut long enough for a close fit between the side rails. This was attached to a ⅞ by 2 by 9-in. cleat on each rail, so placed that the top of this board was flush with the top of the side rails. The cleats were glued and screwed to the side rails with five No. 10 by



1½-in. f.h.b. screws, and the cross piece attached to the cleats at both ends with five screws of the same size.

The middle leg was carefully centered on this cross piece and glued and screwed with 5 No. 12 by 2-in. f.h.b. screws. Besides this, it was braced with four suitable angle irons, as indicated.

The top was made up of enough 1½-in. planks to make the surface 42 in. wide and 8 ft. long. These were doweled and glued together.

After smoothing and leveling the surfaces, the top was carefully centered on the frame of the table and screwed to the rails with No. 14 by 2½-in. f.h.b. screws, placed about 10 in. apart, and countersunk below the table top.

All exposed surfaces except, of course, the top, were then stained the desired color.

After staining and rubbing down, filler was applied and rubbed across the grain to prepare for the varnish coat which was then applied. After drying for 24 hours, the varnish was carefully rubbed down with 2/0 sandpaper, and another coat applied. The second coat, after 24 hours, was rubbed to a finish with ground pumice stone, linseed oil, and a felt pad.

The linoleum was next cut about ⅛ in. larger all around than the table top, and the surface of the table coated with linoleum cement. The linoleum, rolled, was placed at one end, with ⅛-in overhang, and slowly rolled flat on the table. A good-sized bottle was used to roll out the air bubbles and insure a flat contact. Then heavy planks were placed on top of the linoleum, and heavy weights were added to help place pressure on the linoleum and produce a smooth, even surface. After the glue had been allowed to dry overnight, the linoleum was trimmed flush with the table edge with a plane.

Four oak strips were cut, 1⅝ in. wide, ½ in. thick, and about 2 in. longer than the side and end rails. One end of each of these was cut at 45-deg. miter and laid on the rails to locate the miter cut on the other end. Holes were bored with a 3/16-in. drill about every 8 in. for the screws. These holes were countersunk slightly. The strips were sanded and attached with No. 8 by 1-in. oval-headed brass screws, being careful to have a neat miter joint at the corners and to have the top of the oak strips just flush with the top of the linoleum.

Five strips were made of 16-gauge brass, long enough to just snugly fit around the legs. Before bending around the legs, these strips were slightly hammered with the round end of a ball-peen machinists' hammer to give an artistic finish. The adjacent edges were soldered and small holes were bored, as shown, to receive No. 16 by 1-in. brass escutcheon pins. These brass bases were varnished, and after attaching 1-in. metal silencers on the bottom of each leg, the table was completed.

The total cost of the table was then computed. In detail it was as follows:

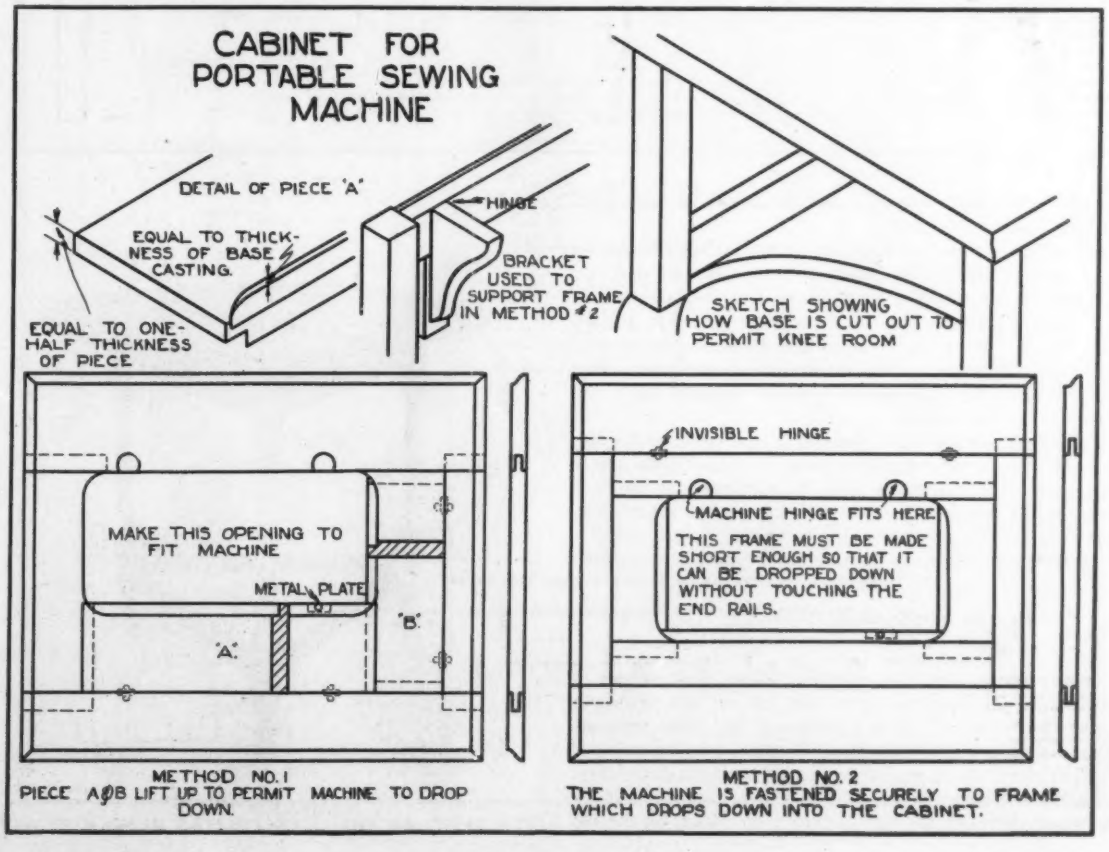
Top	$ 5.60
Legs	2.81
Apron	1.75
Oak rail	.80
Screws	.60
Other hardware, stain, etc.	1.00
Linoleum cement	.25
Linoleum	3.20
Total per table	$16.01

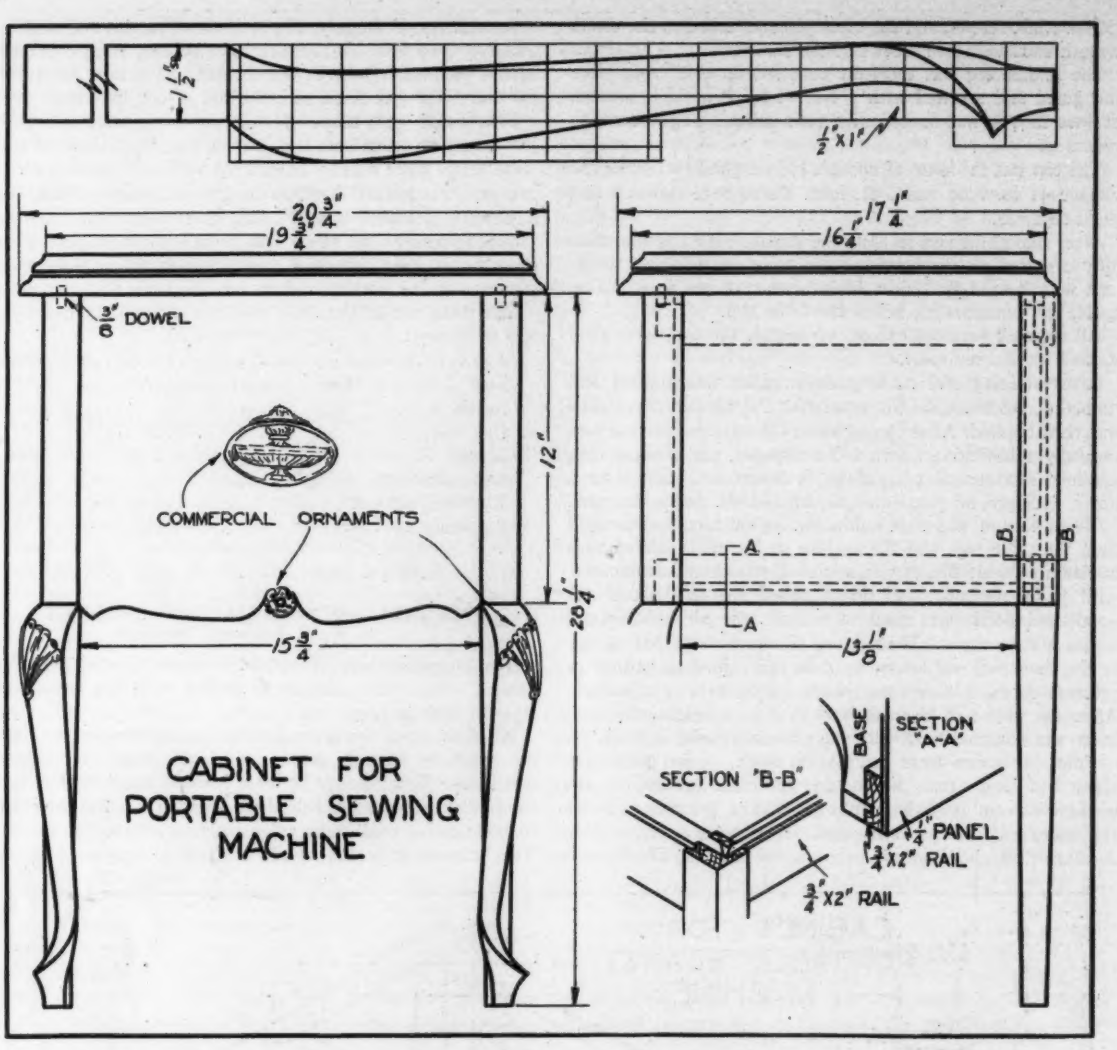
PORTABLE SEWING-MACHINE CABINET

C. R. Wells, Ironwood, Michigan

The accompanying illustrations show a sewing-machine cabinet which will compare favorably with the commercial style of cabinet now used.

No dimensions are given for the framework because different machines vary in the shape of the base. Two different methods of framing may be used. Method No. 1 appears to be the best as it eliminates vibration. Method No. 2 is the easiest to build and is used quite extensively in commercial cabinets. The framework in the second method is supported by two


CABINET FOR PORTABLE SEWING MACHINE
DETAIL OF PIECE 'A'
EQUAL TO THICKNESS OF BASE CASTING.
EQUAL TO ONE-HALF THICKNESS OF PIECE
HINGE
BRACKET USED TO SUPPORT FRAME IN METHOD #2
SKETCH SHOWING HOW BASE IS CUT OUT TO PERMIT KNEE ROOM
MAKE THIS OPENING TO FIT MACHINE
METAL PLATE
'A'
'B'
METHOD NO. 1
PIECE A & B LIFT UP TO PERMIT MACHINE TO DROP DOWN.
INVISIBLE HINGE
MACHINE HINGE FITS HERE
THIS FRAME MUST BE MADE SHORT ENOUGH SO THAT IT CAN BE DROPPED DOWN WITHOUT TOUCHING THE END RAILS.
METHOD NO. 2
THE MACHINE IS FASTENED SECURELY TO FRAME WHICH DROPS DOWN INTO THE CABINET.



brackets which fold back. This method is not as substantial and convenient as the first.

Box hinges are used to support the top, invisible hinges on the framework, and butt hinges on the door. All portable machines are made with a hinge attached to the base casting. This hinge is fastened to the framework in either method used. There is also a thumb screw which fastens into an iron plate that is fastened to the bottom side of the frame. This thumb screw and plate should be used to hold down the machine in either method.

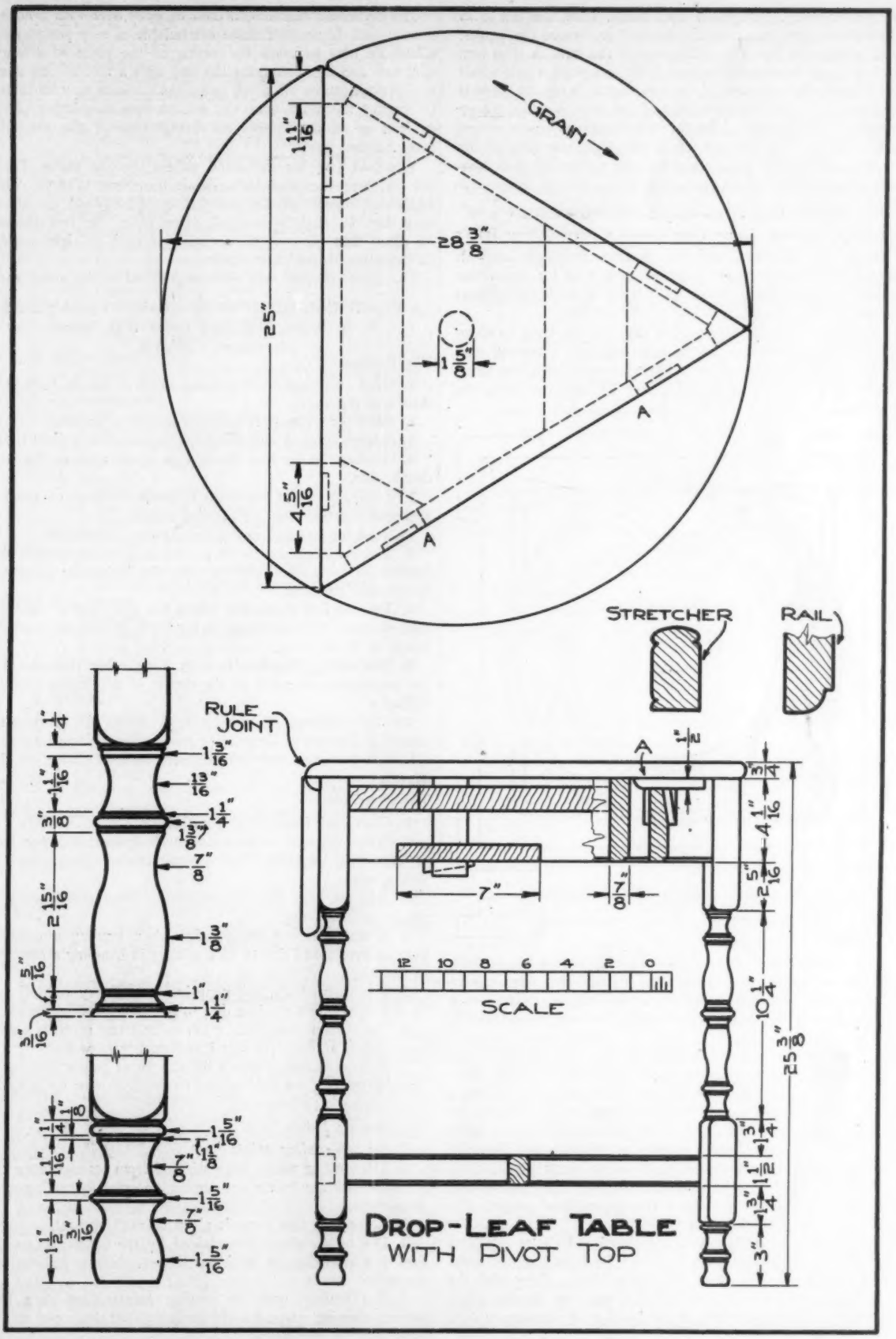
The leg carving should be bent to fit the curve of the leg. To bend the carvings, stretch a piece of cheese cloth tightly over a pan of hot water and place the carvings with the back down, on the cloth. Allow the water to come to a boil. This brings out the adhesive material, afterward the ornament may be pressed down firmly in the position which it is to occupy.

DROP-LEAF TABLE

Burl N. Osburn, Columbus, Ohio

This is one of the many interesting and useful types of small tables developed during the last half of the seventeenth century in America. It is so constructed that three segments of the round top may be dropped, leaving a triangular-shaped top. The three turned legs are connected by molded stretchers and rails, mortised and pinned. The rails are cut away at the top where they join the legs to permit the hinges on the top

DROP-LEAF TABLE
PROPERTY OF THE METROPOLITAN MUSEUM OF ART


GRAIN
28 3/8"
25"
1 11/16"
1 5/8"
4 5/16"
A
A
STRETCHER
RAIL
RULE JOINT
7"
7/8"
SCALE
12 10 8 6 4 2 0
DROP-LEAF TABLE
WITH PIVOT TOP

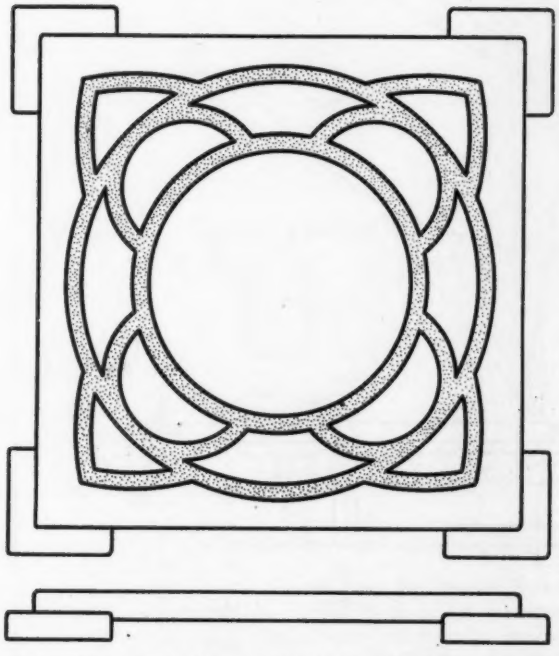
to rotate freely. Just below each hinge, when the top is in position to drop, the rails are beveled to receive the hinges, and permit the top to drop flat against the rails. A false top, or brace, cut away at the corners, is fit between the rails a half inch below the underside of the top proper. A second brace is fastened across at the lower edge of the rails. A round pin on which the top revolves goes through these two braces and is keyed below. The circular top is cut along the lines of the rails, so that when it is turned to such a position that these edges are parallel to the frame the leaves may be lowered.

WOOD CARVING AND APPLIED DESIGN

Emilie P. Lindner, Junior High School, Caldwell, New Jersey

Boys like to carve, and the problem described herewith makes a neat little stand which may be used for supporting small vases or choice pieces of pottery of such proportions as not to hide too much of the carved design.

The tools used for this project may be the same as those used for block cutting; that is, a parting tool, a veining tool, and a gouge. In case of very limited tool supply, the small blade of a very sharp penknife may be used for doing the carving.



In making the design, a ¼-in. border should be allowed. If the finished article is to support a particular vase or piece of pottery, provisions may be made in the design for a depression in the center into which the base of the article to be supported, fits.

Sharp curves and small portions of raised surfaces that may easily be chipped away, should be avoided. In the illustration shown herewith the sectioned area indicates the parts that are to be cut out. After the design has been drawn on paper, it may be transferred to the best surface of the block of wood to be carved, with a piece of carbon paper. Then the entire design should be outlined to an even depth, after which the wood may be removed with a gouge. This should also be done to an even depth. One-sixteenth of an inch will suffice to show up the design well.

After the carving has been completed and all irregularities have been removed, the surface may be lightly sanded with 3/0 sandpaper, held over a sanding block. Then fold the sandpaper, and holding it vertically, go over the cut edges carefully. The outer edges of the block and the corners may be rounded off slightly.

The depressed area should then be gone over with a background tool. If none of these is available, a very serviceable substitute may be made by cutting off the point of a large wire nail and cross-hatching the end with a file. If this part of the work causes too much noise, the students may be asked to support the block upon the smooth face of a heavy piece of iron or an anvil while the background of the block is being worked upon.

The four feet for the stand should then be made. They are set into the base to a depth of about 1/16 in. The edges and corners of the feet that extend beyond the block may then be slightly rounded, after which the feet should be glued into place with the grain of each at right angles to the grain of the larger square.

The entire project may then be finished in the usual way.

A PRACTICAL METHOD OF GRADING DRAWINGS

H. E. Welch, Richmond Union High School, Richmond, California

The Problem

1. Need of a method of grading which is fair to both student and instructor.
2. Need for a rapid yet accurate system of grading.
3. A large number of drawings to be graded in a short time.
4. Grading the drawing should take a minimum of the student's time.
5. Tendency of the instructor to grade drawings on general appearance rather than on detailed merits.
6. Need for frequent instructor-student conferences.
7. The drawings are to be graded in conference with the student so as to check errors with him before he advances to the next drawing.
8. This method of grading forces the attention of the student to recurring weaknesses in his work, as well as to errors which he is repeating.
9. Tendency of student to copy from other students and the consequent necessity of the means of developing student initiative.
10. This method of grading is a means of introducing checking. The use of the *grading points* sheet fosters accuracy, attention to detail and completeness of information on the drawing.

The Conditions

1. Classes of from 20 to 28 students.
2. Course planned to keep student busy on short, type jobs of increasing difficulty. The average student completes 2½ jobs a week.
3. Jobs are kept short to maintain interest and to cover a single teaching point.
4. A fine teaching opportunity when grading a drawing may be overlooked due to lack of time in handling a quantity of drawings.
5. The instructor's judgment has a tendency to dull and he is apt to slight grading due to quantity of work handled.
6. The student completes a job quickly and receives a definite reward at once for speed and quality of work.
7. It is necessary to have a definite set of points thoroughly familiar to both the student and to the instructor upon which the drawing is to be graded.

The Grading Points Sheet

1. See the *grading points* sheet.
2. The grading points were selected from several terms experience with the course and noting the errors occurring most frequently.
3. A copy of this sheet is given to each student.
4. Use of the sheet is explained by the instructor on the first few drawings or sketches. The student underlines the important words.
5. The student uses the *grading points* sheet as a hint source, showing where he will probably find the errors or the omissions on this drawing.

GRADING POINTS

I. SHAPE
- A. *Proportion*
  1. Make sketch look like object.
  2. Sketch must not be too large nor too small.
- B. *Position on Sheet*
  1. Borders must be even to balance.
  2. Have the views properly spaced.
  3. Leave no large empty spaces between or around the views.
  4. The views must not be crowded.
  5. Lettering must not be crowded up to the views.
- C. *Workmanship*
  1. Make the corners meet properly.
  2. Use only correct line weights.
  3. Make the center line and hidden lines properly.
  4. Make the object stand out. (Contrast)
  5. Check all partly erased lines.
  6. Make tangents meet.
  7. Check border line weights.
  8. Make title space correctly.

II. SIZE (dimensioning)
- A. *Position*, the dimensions must be in the proper place.
- B. *Workmanship*
  1. See that all arrowheads are correctly made.
  2. Have the line weights or widths right.
  3. Form the numbers in the dimensions correctly.

III. LETTERING (The talk)
- A. *Spacing*
  1. Have the letters and words evenly spaced.
  2. Dot the *small* "i's" and check for periods.
  3. Check for misspelled words.
  4. Balance all lettering. Keep guide lines very light.
- B. *Letter, Shape*
  1. All letters must be properly formed.
  2. Uniform slant improves letter appearance.

IV. NEATNESS
- A. *Cleanliness*
  1. Erasing messes a sheet.
  2. Keep your hands clean.
- B. *Wrinkles* and torn edges spoil a good-looking sheet.

V. WORKING ATTITUDE
1. Use correct pencils or pens.
2. Keep your tools sharp and clean.
3. Waste no time.
4. Do not borrow. Be prepared.
5. Be interested in your work.
6. Keep your desk in good working condition.

Accuracy to within 1/64 in. is necessary on all drawings. Greater difference than this lowers the grade or will necessitate making the drawing over.

6. Student is advised to go over the drawing he has just completed and find his own errors from the sheet.

7. The sheet is planned to emphasize the points commonly overlooked by a student in making the drawing.

Use

1. Instructor goes over drawing with the class waiting to have the first set of sketches graded, and each student checks his drawings for errors from the sheet.

2. Each heading on the sheet is given a value of five points.

3. Student will not use sheet without a further incentive and must be convinced that he can get better grades by its use. The use of the *grading points* sheet must be sold to him.

4. The student uses the sheet until he becomes familiar with it. Then he may use it only for occasional reference. A condensed *grading points* sheet for student use is preferred.

5. Most students resent marks made on the drawing by the instructor for correction.

6. Student brings drawing to desk for initial check, instructor goes over sheet with him pointing out errors and discussing work with him, suggesting solutions in such a way that student is thrown on his own resources for the actual solution, marks initial in checking space and sends drawing back for correction.

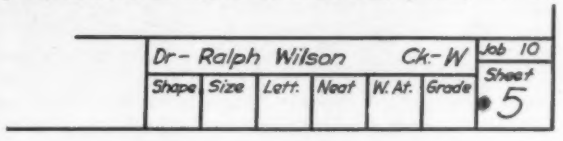
7. Student gets one chance on drawing, otherwise the teacher would be grading his own work and judgment. This fosters some original investigation from the reference texts and some conferences with other students, a certain amount of copying and in general gives a better indication of the student's ability.

8. When the drawing comes in the second time, the instructor goes over the drawing again with the student, and using the *grading points* sheet, sets the grade on the quality of the drawing. This is the point where the most effective teaching may be done.

9. This method sets a definite reward for good workmanship and correctness of information, and a definite penalty for poor workmanship and faulty attention during lectures and discussions.

10. It is not the instructor's place to do any of the student's thinking or drawing.

11. Instructor must have a handy copy of the *grading points* sheet on his desk for reference while grading drawings.



GRADING SPACE IN TITLE

12. The use of the *grading points* sheet is an aid to the instructor in checking points commonly missed by the student when grading the drawing.

Grading Space in Title

1. See drawing of title space.

2. Group headings on the *grading points* sheet are used in the title spaces.

3. Grades are evaluated as shown:
   Grade of 1 valued as 5 points
   Grade of 2 valued as 4 points
   Grade of 3 valued as 3 points
   Grade of 4 valued as 2 points
   Grade of 5 valued as 1 point

4. The final grade of the drawing is the arithmetical average of the five grades earned.

5. When no dimensioning occurs on the sheet a check may be placed in that square and the average taken for only four headings.

A SURVEY OF PRINTING EDUCATION IN THE UNITED STATES

In November, 1926, the department of education of the United Typothetae of America published an interesting report of a survey of printing instruction in the United States and Canada. Early in 1930, Mr. Fred J. Hartman, director of the department of education, sent questionnaires to teachers and administrative officers in schools known to be offering instruction in printing. The work of analyzing the replies to the questionnaires, and preparing a report was placed in charge of Mr. David Gustafson, professor of printing at the Carnegie Institute of Technology.

More than 500 schools, including practically all of the larger schools, were represented in the survey, and the contributing schools were considered as representing a fair sample of the important types of schools offering printing in all sections of the country. The states from which ten or more schools submitted reports were as follows: Massachusetts, New York, California, Ohio, New Jersey, Pennsylvania, Illinois, Minnesota, Michigan, Indiana, Kansas, Wisconsin, and Connecticut. Twenty-six other states and the District of Columbia also reported.

An idea of the size and importance of the program of printing instruction carried on in public and private schools may be gained from the data, which shows that of a total of 523 institutions, 161 are academic high schools, 154 are junior high schools, 48 are trade or vocational schools, 43 are technical high schools, and 26 are colleges and universities.

In the preparation of the data, each school was assigned to one certain class, usually that of the highest scholastic level upon which the printing instruction is offered. For example, academic high schools giving junior-high-school work in printing were classified as academic high schools. Of the schools offering more than one type of instruction in printing, 53 were junior high schools, 46 were evening schools, 16 were part-time schools, and 16 were technical high schools.

The complexity of the situation in printing education is noted in the various types of schools listed. An analysis of such items as length of course, hours per week, subjects taught, textbooks used, and programs of work revealed wide divergences of aims, programs, and teaching technique in each of the major classifications. As to length of course and hours per week, the medians for each of the larger classes of schools teaching printing are as follows: Teachers' colleges, 36 weeks, 8 hours per week; academic high schools, 450, 400, 300, and 275 minutes per week; technical high schools, 15 and 7½ hours per week; junior high schools, one-half and one-year courses common, 4–5 hours per week; elementary schools, one-half and one-year courses common, 5 hours per week in many schools; trade or vocational schools, wide diversity; schools for the deaf, 4–5 years, 15 hours per week.

Greater uniformity was noted in the subjects taught in the departments of printing. Hand composition is taught in all schools, while presswork is almost equally popular. In the schools emphasizing vocational training, bindery and machine composition are common subjects of instruction. A few of the schools offer monotype courses, and one listed Ludlow composition; most of the work in machine composition, however, is offered in the linotype field. Many of the schools stated that the bindery work is of a very elementary character. While the terms "other shop subjects" and "related subjects" were sometimes confused, it was clear that few schools attempted other shop courses than the three types mentioned. A variety of related subjects is offered, but those most commonly mentioned are English, mathematics, drawing and design, proofreading, and science. A few schools listed such subjects as linoleum-block cutting, costs and estimating, advertising, art, civics, and others.

Many textbooks and works of reference are in use in the departments of printing. Fifty or more schools mentioned Polk's, Henry's, and Levitas's textbooks. Other schools listed works by Mansfield, Thompson, Ginsbach, McClellan, Loomis, Selvidge and Witt, Stilwell, and Karch. In many cases, the books served as reference works rather than texts. The replies indicated the increasing popularity of job sheets, the extended use of curriculum studies, the increasing use of reference libraries, and the growing tendency to familiarize vocational pupils with trade journals. It was apparent that many printing instructors have raised the level of pupil effort from mere practice to understanding and appreciation of the art of printing.

The trade or vocational schools generally had the most expensive equipment, with other groups arranged in the order of the estimated value of the equipment of the median school.

Only 68 schools indicated that an advisory committee representing the industry was coöperating with the school. Many expressed the desire that such a relationship might exist in the near future. Trade organizations have assisted a number of vocational schools in organizing their curricula and obtaining instructional material.

In conclusion, the survey of printing gave evidence of the growing importance of printing in the several educational institutions. Considerable progress was noted in harmonizing curricula and teaching method with the expressed aim and purpose of the courses offered. Individualism has, however, run wild, and there is a need for more coöperative effort in the definition of aims, preparation of courses and instructional material, and training of teachers for the various types of schools giving printing instruction.

NOW, ARE THERE ANY QUESTIONS?

Auto Painting

931. Q.: I want to get specifications for a repainting job on an automobile. I will appreciate it if you will furnish me with these specifications or let me know where I can get them. — *H. A. B.*

A.: Take the car to a washing station and have it "washed for paint shop" which is quite a different thing than the usual job of washing. At the same time have it cleaned with steam and soda around the engine and underside of the hood to remove all traces of oil. Dry overnight.

Cut down the surface level and clean with waterproof sandpaper No. 180 Speedgrits, keeping a sponge saturated with water in the left hand while the quarter sheet of sandpaper, backed with ½-in. felt, is manipulated with the right. Wash down with the hose and plenty of water, sponge dry and then chamois off to prevent bare metal spots from rusting.

Let dry overnight, sand the exposed metal spots with a split 6/0 garnet or No. 280 C, dust off and apply a coat of metal primer to the entire job. If the primer is too heavy as furnished in the can, reduce with turpentine until it flows freely, although the consistency should not be too thin. Let this coat dry overnight.

Sand lightly with a split 6/0 paper, dust off carefully and apply a coat of sanding surfacer which will also probably need reducing with turpentine to the consistency of the finishing enamel. Two or more coats of sanding surfacer may be applied at three-day intervals. The last coat, when well dried, should be cut down fine and level with No. 120 waterproof Speedgrits.

Clean up the shop, wipe down the walls with a damp broom, tack off the body with a good tack rag and then apply a coat of finishing enamel. For this purpose the "quick-drying auto enamel" should be the type chosen. If two or more coats are to be given, the first enamel should dry at least three days before cutting down with waterproof No. 220-A, backed up with a rubber or thin felt pad. Wash off well, chamois dry after taking a water tool around all joints and molding lines. Let dry overnight before applying the last coat.

Tack off carefully just ahead of the brushwork, and as soon as a panel has been brushed in and allowed to flow out, it should be picked with a ball of burnt varnish on the end of a fine wire or thin stick.

All left-over materials can be used on the underside of the fenders and chassis. If the wheels are of the wooden artillery type they should be sanded clean and treated like the remainder of the car.

The top should be washed clean and given one or more coats of "oil-type top dressing" while the leather cushions, if present, should be given a coat of the lacquer-type "seat dressing." — *Ralph G. Waring.*

LEST YOU FORGET

Help to spread unselfish joyousness.

Buy Christmas Seals.

Among the Industrial-Arts Teachers

HAROLD T. WIDDOWSON

ARCHIE S. ZOERB

G. H. HARGITT

J. R. HAWKE

MR. WIDDOWSON GOES TO STATE DEPARTMENT

Mr. Harold T. Widdowson has been appointed supervisor of trade and industrial education for the State of Minnesota to succeed Mr. Dean Schweickhard. Mr. Widdowson holds a B.S. degree in education given in 1926. He was department head and teacher in the industrial-education department at International Falls, Minnesota, previous to going to the state department.

A. S. ZOERB APPOINTED STATE SUPERVISOR

Mr. Archie S. Zoerb, who was recently appointed state supervisor of trade and industrial education for Tennessee, is a graduate of the Oshkosh, Wisconsin, State Normal School and holds a B.S. degree given by the University of Tennessee. Mr. Zoerb was an instructor in the Vocational School, Sheboygan, Wisconsin, in 1919, and in 1920 was an instructor in the Milwaukee Vocational School. From 1927 to 1930, he was head of the auto-mechanics department in the high school at Knoxville. He is active in the affairs of the East Tennessee Vocational Teachers' Association and was president of the Association in 1929–30.

G. H. HARGITT MADE SUPERVISOR

Mr. G. H. Hargitt, formerly assistant to the director of guidance and placement in St. Louis, Missouri, was recently made supervisor of manual arts for the public schools of that city. He was for some time an instructor in the evening vocational schools of St. Louis. Mr. Hargitt was appointed to fill a vacancy caused by the transfer of Mr. B. W. Noel to the Hadley Vocational School.

J. R. HAWKE APPOINTED DIRECTOR AT OMAHA

Mr. Jerry R. Hawke, who recently assumed his duties as director of trade and industrial education in Omaha, Nebraska, is a graduate of Carnegie Institute of Technology in Pittsburgh, and of the Pennsylvania State College, and holds degrees given by both institutions.

Mr. Hawke is well qualified for his duties, both from the viewpoint of professional preparation and from practical experience in the field. He completed work for his master's degree in the Pennsylvania State College, majoring in vocational education. His experience has been extensive, comprising not only schoolwork, but a varied experience in industry as well.

Previous to his appointment at Omaha, Mr. Hawke was director of vocational education at Port-au-Prince, Haiti, from 1925 to 1930. Before that, he was director of vocational education at North Braddock, Pennsylvania, and principal of the Y.M.C.A. night school in Pittsburgh. He was an instructor in handwork in the De Paul Institute for the Deaf and Dumb and was responsible for the organization of the first general industrial school in Pennsylvania at North Braddock.

¶ Mr. T. G. Murray has entered upon his eighteenth consecutive term as president of the board of vocational education at Madison, Wis. During his period of service, the day school has grown in enrollment from 81 to 1,562, and the evening-school enrollment from 562 to 3,175.

¶ Mr. Frank J. Earl, of Battle Mountain, Nev., has taken up his work as instructor of day trade classes in carpentry and organizer of evening and part-time classes at Willcox, Ariz.

¶ Mr. J. H. Porteous, of Los Angeles, Calif., has been appointed instructor of day trade classes in auto mechanics in the high school at Mesa, Ariz. As part of his work, Mr. Porteous will make a study of the vocational needs of the community and will organize classes suited to those needs.

¶ Mr. P. W. Loucks will make a study of the trade and industrial needs at Glendale, Ariz., and will organize evening and part-time classes to meet those needs. Mr. Loucks is a graduate of the University of Illinois. He was at one time appointed state supervisor of trade and industrial education in Illinois, but declined the position in order to accept an appointment in Florida.

¶ Mr. A. E. MacArthur recently resigned the directorship of vocational education at Miami, Ariz., to accept a similar position at Taft, Calif.

FIFTH ANNUAL CONVENTION OF THE AMERICAN VOCATIONAL ASSOCIATION AT MILWAUKEE

The officers of the American Vocational Association have announced the tentative program for the fifth annual meeting of the association, to be held December 10 to 13, at Milwaukee, Wis. The headquarters for the meeting will be in the Hotel Schroeder. The general session will be held in the auditorium of the Milwaukee Vocational School, the open house for delegates in the Boys' Technical High School, and the sectional meetings in the Milwaukee Auditorium and the Milwaukee Vocational School. The program is as follows:

General Session

Wednesday, December 10

Address of Welcome, Supt. M. C. Potter, Milwaukee, Wis.

Response, Hon. William A. Sutton, state superintendent of public instruction, Atlanta, Ga.

Friday, December 12

Ship Program.

Sectional Meetings: Home Economics

Thursday, December 11

Topic: *Constructing a Home-Economics Curriculum to Meet the Needs of Family Life.*

Friday, December 12

Topic: *Meeting the Needs of Home-Economics Groups Out of Day School.*

Saturday, December 13

Topic: *Measuring the Results of Teaching.*

Sectional Meetings: Rehabilitation

Thursday, December 11

Topic: *Vocational Education in Rehabilitation.* Mr. H. L. Stanton, Raleigh, N. C., chairman.

Friday, December 12

Topic: *Guidance in Rehabilitation.* Mr. W. F. Faulkes, Madison, Wis., chairman.

Saturday, December 13

Topic: *Obstacles to Placement of Cripples in Industry.* Miss Tracy Copp, Federal Board for Vocational Education, Washington, D. C.

Sectional Meetings: Agricultural Education

Thursday, December 11

"The Agricultural Teacher in the Community," Mr. A. J. Glover, Chicago, Ill.

Friday, December 12

Report of committee on project records and recordkeeping.
Progress report on agricultural education.

Saturday, December 13

Report of future farmers of America activities.
Progress report on relations with other organizations.

Sectional Meetings: Part-Time Education

Thursday, December 11

Topic: *Beginnings in Part-Time Education.* Dr. Jennie M. Turner, Madison, Wis., chairman.

Friday, December 12

Topic: *Coördination in Part-Time Education.* Mr. I. S. Noall, Salt Lake City, Utah, chairman.

Saturday, December 13

Topic: *Present and Future in Continuation Education.* Mr. W. J. Regan, Buffalo, N. Y., chairman.

Sectional Meetings: Industrial Education

Thursday, December 11

Topic: *Vocational Education as a Constructive Factor in Industry.* Mr. John Callahan, Madison, Wis., chairman.

Friday, December 12

Group II, Topic: *Examples of School Training for Unskilled and Semiskilled Work.* Mr. K. G. Smith, Lansing, Mich., chairman.

Group III, Topic: *Examples of Vocational Education in a Small Community.* Mr. H. G. Noyes, Appleton, Wis., chairman.

Group IV, Topic: *Training for Junior Technical Positions in Industry.* Mr. Nicholas Ricciardi, Sacramento, Calif., chairman.

Saturday, December 13

Group I, Topic: *Examples of Training in Industry for Specialized Operations.*

Group II, Topic: *Some Results of Apprentice Training.* Mr. Harold Falk, Milwaukee, Wis., chairman.

Group III, Topic: *The Foreman in Industry.*

Sectional Meetings: Industrial Arts

Thursday, December 11

Topic: *Good Practice in School Use of the General Shop.* Mr. R. W. Selvidge, Columbia, Mo., chairman.

Friday, December 12

Topic: *Implications in Industrial-Arts Teaching Development.* Mr. G. K. Wells, Indianapolis, Ind., chairman.

Saturday, December 13

Topic: *Annual Report of the American Vocational Association Committee on Standards in Industrial Arts.* Mr. E. E. Ericson, Santa Barbara, Calif., chairman.

Sectional Meetings: Vocational Guidance

Thursday, December 11

"National Trends in Guidance Procedures," Miss Emma Pritchard Cooley, director of vocational guidance, New Orleans, La.

Friday, December 12

"Organization and Operation of a Program of Guidance, Placement, and Coördination in a Part-Time School," Mr. W. F. Patterson, director of guidance, Milwaukee Vocational School.

Saturday, December 13

"Education, Employment, and Unemployment," Mr. William Leiserson, Antioch College, Yellow Springs, Ohio.

Sectional Meetings: Commercial Education

Thursday, December 11

Topic: *What Can the School at all Levels Do to Promote Trade Preparation and Trade-Extension Training?* Mr. John Malott, Washington, D. C., chairman.

Topic: *The Needs of Retail-Selling Business.*

Friday, December 12

Topic: *The Needs of Public Utilities.*

Saturday, December 13

Topic: *Demonstration of Methods of Developing Individuals for Various Positions in the Merchandising Field.* Mr. L. L. Pidcoe, manager, Burdick and Murray Company, Madison, Wis.

Sectional Meetings: Printing Education

Thursday, December 11

Mr. Ira D. Pilliard, Milwaukee, Wis., chairman.

Topic: *Modern Typography,* Mr. Arthur S. Overbay, International Trade Composition Association, Indianapolis, Ind.

Sectional Meetings: Decorating Instructors

Address of Welcome, Mr. Ted Holland, Milwaukee, Wis.

Friday, December 12

Demonstrations of Plastic Paints and Color Harmony, Mr. James Stewart, Eagle Picher Lead Co., Chicago, Ill.

"Demonstration of Graining," Mr. John York, Burlington, Wis.

"Demonstration of Paper Hanging," Mr. A. L. Clark, Chicago, Ill.

Trade-School Principal

"Duties of a Trade-School Principal," Mr. R. T. Craigo. assistant director, William Hood Dunwoody Institute, Minneapolis, Minn.

Wednesday, December 10

"State Supervisors of Industrial Education." Mr. K. G. Smith, Lansing, Mich., chairman.

Topic: *Development of Closer Relations Between Industry and the Vocational Schools.*

Topic: *The In-Service Training of Trade Teachers from the Standpoint of Supervision.*

Saturday, December 13

Plumbing and Steamfitters' Conference. Mr. John Shanahan, New York City, chairman.

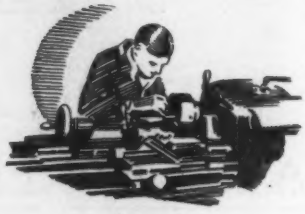
Round-table discussion.

ARKANSAS VALLEY MANUAL-ARTS CLUB MEETS AT WINFIELD, KANS.

The Arkansas Valley Manual-Arts Club held its annual meeting on Saturday, October 18, at Winfield, Kans.

Mr. J. W. Gowans, of Hutchinson, the principal speaker, talked on the subject, "The Cultural Value of a Program of Manual Arts." He commended the present teachers of industrial work on their higher standards of preparation, and

(Continued on Page 28a)



OPPORTUNITY

ABOVE—Tilden Technical High School, Chicago, Illinois. Exterior.

AT RIGHT—Interior view, machine shop, Tilden Tech.

BELOW—Some Illinois installations of Rockford Economy Lathes and Hy-Service Shapers.

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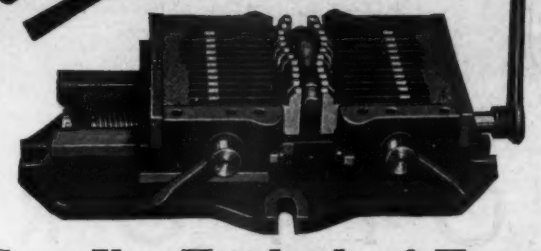

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EFFICIENT INSTRUCTION
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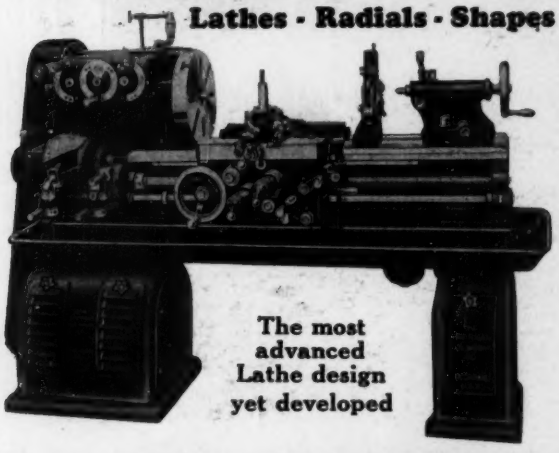

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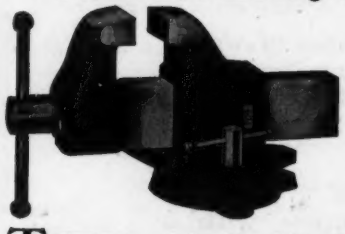

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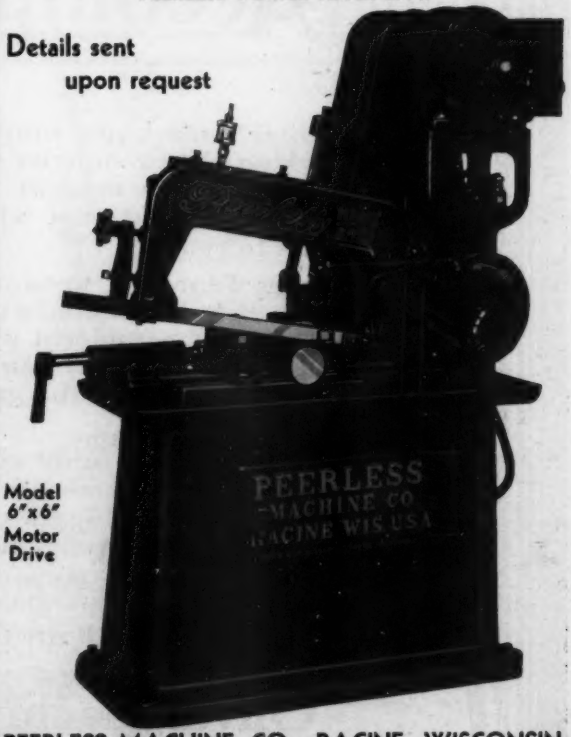

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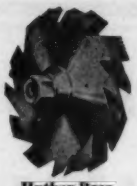

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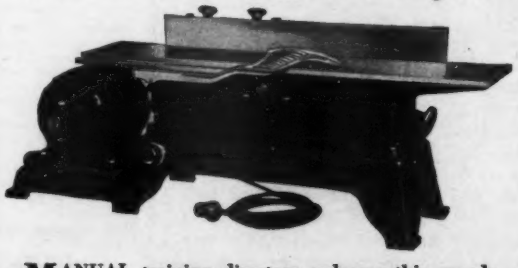

MANUAL training directors welcome this speedy and highly accurate machine. It provides the means of teaching planing, jointing, beveling, and rabbetting, and yet is but a part of the complete woodworking shop you can have under the H. & A. Plan for moderate budgets. A high grade heavy duty machine. Thoroughly safe for students. Accuracy that's assured by an exclusive adjustment...locked at the factory.

Visit our Booth No. 20 at the A. V. A. Convention in Milwaukee

Write today for the H. & A. Free Catalog showing our complete line of portable woodworking machines, especially adaptable to manual training rooms. It includes Band Saws, Rip Saws, Jointers, Lathes, Swing Saws, Shapers, Scroll Saws, Glue Pots, etc. Send at once.

HESTON & ANDERSON
312 Kirkwood Ave., Fairfield, Iowa

A Special School Model Blue Printing Machine!

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"JUNIOR"
BLUE-PRINTING
EQUIPMENT
AT MILWAUKEE

BOOTH No. 10
A. V. A. CONVENTION

THE PEASE "Junior" Blue-Printing Machine and Sheet Washer is a special school model Blue-Printing Equipment and will produce A. No. 1 blue-prints in any size up to 24x36" in from one to one and one-half minutes.

Initial investment is small, operating expense is reduced to a minimum, and the complete equipment can be stood in a corner of the classroom.

The Machine can be plugged directly into the lighting circuit and will operate on either 110 or 220 volts AC or DC. The Sheet Washer has both spray pipe and drain pipe thereby eliminating open trays of water, dripping prints, and wet floors.

THE C. F. PEASE COMPANY

802 North Franklin Street, Chicago, Illinois.

PEASE

BLUE PRINTING MACHINERY

Mail Today

The C. F. Pease Company,
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Gentlemen:
Please send me School Catalogue MJ-32X, and complete facts and prices on the "Junior" Equipment.

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May be identified by that mark stamped on every jaw, without that mark they are not "JORGENSEN" Peerless.

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12 Sizes—Adjustable or Non-Adjustable

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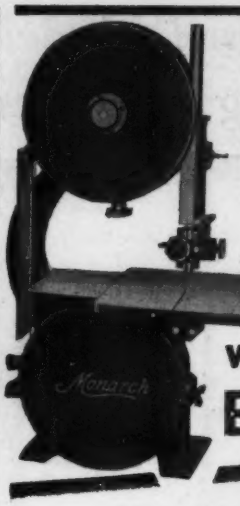

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ACCURACY
ECONOMY..
Yours
with this BENCH
BAND SAW!

Guaranteed for long hard service, this Bench Band Saw will handle the most delicate patterns with ease. 12" and 16" size. Completely enclosed. Built-in motor operates from lighting current. Handy—Husky—Adaptable . . . a money-maker and a necessity for the modern shop!

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Special bulletins on band saws, mortisers, planers, jointers, variety wood workers, hoists, saw tables and saw mills are yours for the asking. Write for them!

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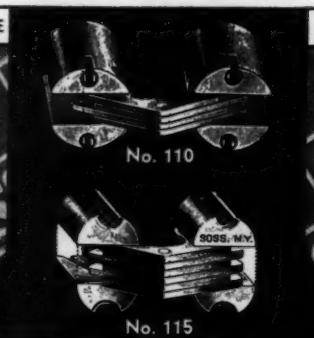

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WITH the door or panel closed, Soss hinges are completely invisible, thus eliminating undesirable interruptions in the structural lines of the door or cabinet.

Manufactured with scientific precision as befits a quality product yet surprisingly low in cost.

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Catalogue "F" Upon Request
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A good workman knows his tools. The more familiar he is with them, the better qualified he is to do his work. Manual training schools all over the country make a practice of using tools and machinery most commonly found in industry, in order to familiarize their students with what they will actually encounter upon leaving school. That is why Cleveland grindstones are found in nearly every manual training school in the country.

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Builders Exchange Bldg. Cleveland, Ohio
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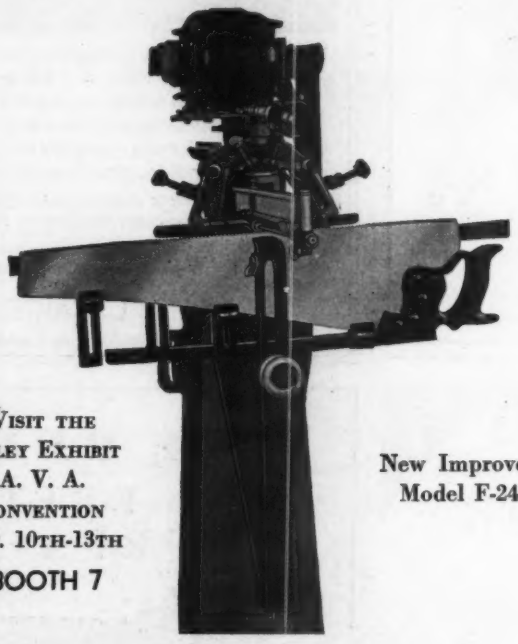
Machine Filed Saws Save Time and Labor

END your saw-filing troubles by filing ALL your saws on a Foley Automatic Saw Filer. It files them better and quicker than by hand, and eliminates the tedious, eye-straining work. Students can operate the Foley Filer, and with a little practice, turn out perfectly filed saws.



VISIT THE FOLEY EXHIBIT A. V. A. CONVENTION DEC. 10TH-13TH BOOTH 7

New Improved Model F-24

FOLEY AUTOMATIC SAW FILER

Files All Kinds of Saws Automatically

All kinds of hand saws, band saws and cross-cut circular saws are filed *automatically* on the Foley, and at the same time, jointed. Every tooth is filed exactly uniform in size, height and spacing, so that *every tooth cuts.* Saws can be filed with any desired bevel, and band saws with any hook.

Manual training departments in hundreds of schools are using the Foley Filer to keep their saws in perfect cutting condition. They are enthusiastic about the work the machine does and the time and labor it saves the teacher. The list on the right is a partial list of schools owning and using the Foley Automatic Saw Filer.

PARTIAL LIST OF SCHOOLS USING THE FOLEY FILER

Alabama Polytechnical Institute
Alhambra City (Calif.) High School
Battle Creek (Mich.) Public Schools
Board of Education, *Baltimore, Md.*
Board of Education, *Charlotte, N. C.*
Board of Education, *Cleveland, Ohio*
Board of Education, *Great Falls, Mont.*
Board of Education, *Hutchinson, Kans.*
Board of Education, Rochester, N. Y.
Board of Education, *South Orange, N. J.*
Board of Education, *Tulsa, Okla.*
Buffalo (N. Y.) Public Schools
Chattanooga (Tenn.) Public Schools
Chicago (Ill.) Public Schools
Colorado School for Deaf and Blind
Connecticut Agricultural College
East St. Louis (Ill.) High School
Industrial School Dist., *Des Moines, Ia.*
Iowa State Teachers College
Isaac Delgado Trade School
Jacksonville (Fla.) School for Deaf
Kansas Agricultural College
Lincoln (Nebr.) Public Schools
Meriden (Miss.) Schools
Minneapolis (Minn.) Public Schools
Omaha (Nebr.) Public Schools
Oregon Agricultural College
Pittsfield (Mass.) High School
Phoenix (Ariz.) Public Schools
Santa Cruz (Calif.) High School
School Board, *Washington, D. C.*
State Trade School, *Danbury, Conn.*
Stockton (Calif.) Public Schools
Stout Institute
Topeka (Kans.) Public Schools
University of *Illinois*
University of *Kentucky*
University of *Missouri*
Utah Agricultural School
Western State College of *Colorado*
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Frank Wiggins Trade School
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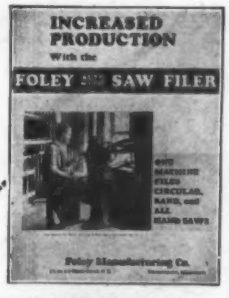


FOLEY MANUFACTURING CO.
18 Main St. N. E., Minneapolis, Minn.

Please send complete information about the New Improved Foley Automatic Saw Filer, Model F-24

Name.....
School.....
City..... State.....

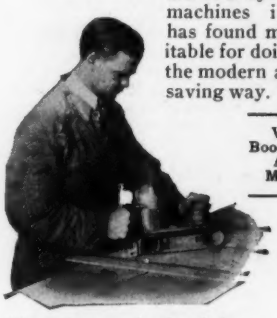
Everything's changed but—

The old school shop method of making boys do a lot of unnecessary hand work.

Why not teach them the modern way of doing things? Double the value of your instruction periods. Teach accuracy and speed at the same time.

Do this by using the machines industry has found most profitable for doing things the modern and time-saving way.

Visit our Booth No. 49 A. V. A. Milwaukee



Where there was hand surfacing now there's a TAKE-ABOUT SANDER for speed. Useful in the shop . . . pays for itself on maintenance work.

This 16" Band Saw saves both time and material. Vibrationless and true. Many schools find them ideal. Ask us why.

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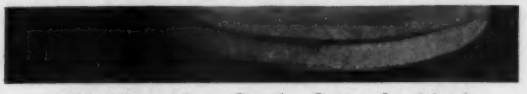
PORTER - CABLE - HUTCHINSON CORP.
Dept. I.A. 12 SYRACUSE, N. Y.

For Straight or Circular Routing



THE Adjustable or Circular Gauge furnished for a Carter R-7 or R-4 Router is one of the many simple attachments which increase the usefulness of these routers in the school shop. The use of these versatile machines gives a professional touch to your finished projects.

See our exhibit in Booth 21 at the Convention of the American Vocational Association, Milwaukee, Wis.

Folder "C" describes the R-4 Router in detail. Send for a copy

THE R. L. CARTER CO.
New Britain, Conn.

CRESCENT

POST BORER

with built-in motor

This inexpensive machine can well find a place in any manual training school. Speed of the bit may be varied from 950 to 1450 R.P.M. Machine is adapted for boring holes up to 1½" in diameter.

The recently issued Crescent Catalog gives detailed specifications of the many quality machines of the Crescent line. It will help to keep you informed on what's new in the woodworking field. Write for it.

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Saw Table
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Variety Wood Worker
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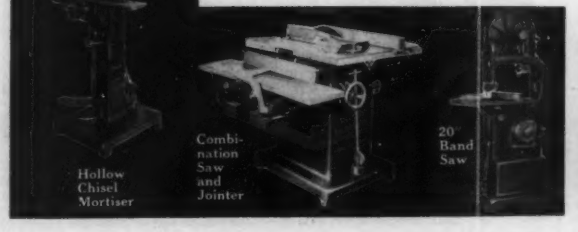

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Includes 16" band saw, 6" jointer and 8" circular rip and cross cut saw.

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PARKS
WOODWORKING MACHINES

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THE fundamental principles of mechanical engineering consist of accomplishing a given end with the least expenditure for mechanism and energy. Does this mean anything to you in the selection of a sander?

THE REID-WAY WHIRLWIND SANDER with its one moving part, attains a greater degree of efficiency than heretofore thought possible in a machine of this type.

THE REID-WAY CORP.

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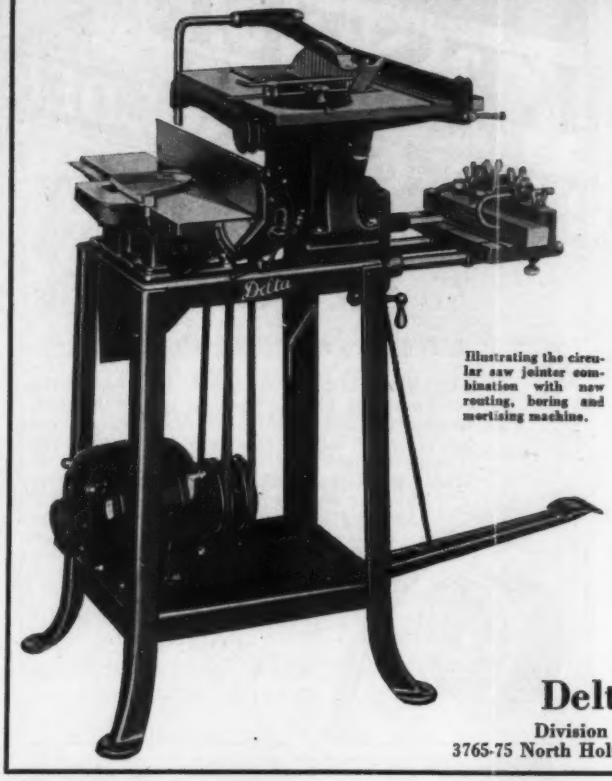
DELTA Woodworking Machinery—



Illustrating the circular saw jointer combination with new routing, boring and mortising machine.

"for school shop economy"

Unit No. 468, pictured at the left, is just one of many Delta Woodworking units that makes for real economy in the school shop. Delta units are built with the one thought in mind of providing the greatest possible service at the lowest cost.

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Readily performs such operations as routing, mortising, drum sanding, disc sanding, grinding, buffing, boring and drilling with chuck, in addition to many jointing, rabbeting and sawing operations.

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can be done faster, more economically and better on Niagara Combination Bench Machines with Interchangeable Faces.

No. 131 C

Interchangeable Faces for Burring, Turning, Wiring, Elbow Edging.

Capacity 22-Gauge

Note the one-piece rugged frame which has the strength for a long life of service and makes safety in operation sure.

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Sold complete with 9 faces, including one pair burring faces, extra upper burr face, two pairs of turning faces, one pair wiring faces, gauge, wrench, bench standard (Elbow faces extra)—or sold as a single purpose machine.

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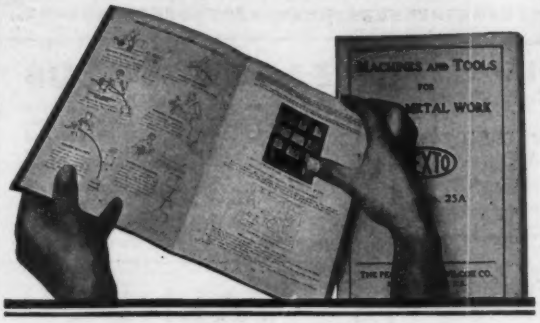

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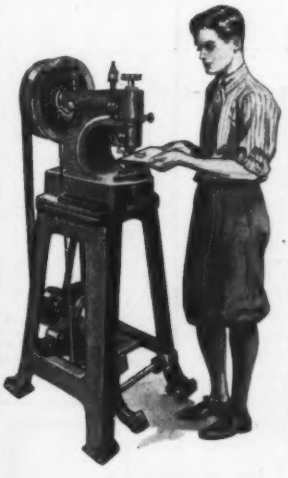

It is true that you should teach hand methods—but it is also necessary that your shop equipment include machines that you will find in every modern machine shop.

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Manual Training Lumber

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FOR CEDAR CHESTS
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Legs ..... .50 set
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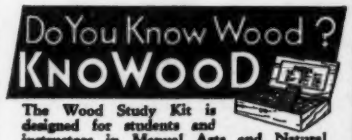

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Cedar	Poplar
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Chestnut	Quar. red oak
Cottonwood	Quar. sap gum
Cypress	Quar. white oak
Elm	Redwood
Hackberry	Sassafras
Hemlock	Spruce
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Our readers are invited to write us on all questions relating to lumber, its uses, sources of supply, methods of finishing, etc. Answers are included in each issue under the department "Now, Are There Any Questions?"

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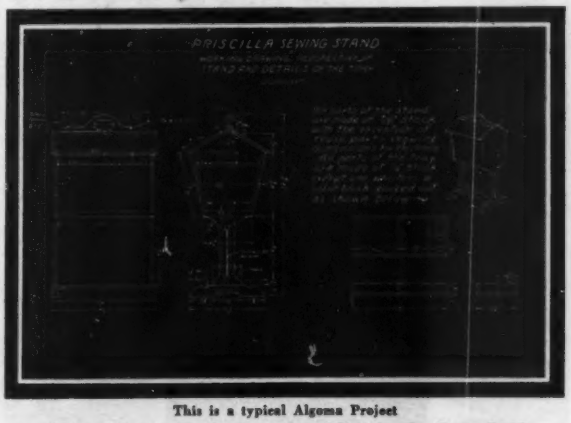

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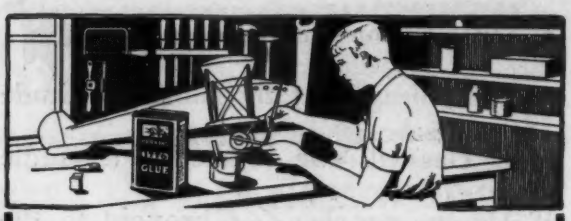

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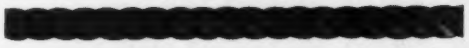

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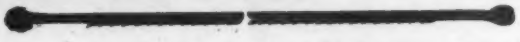
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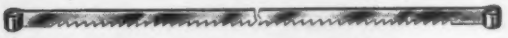
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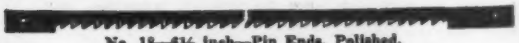
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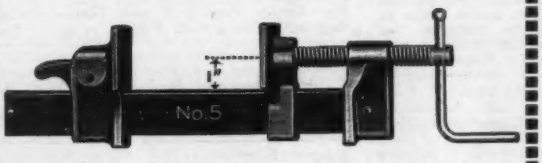

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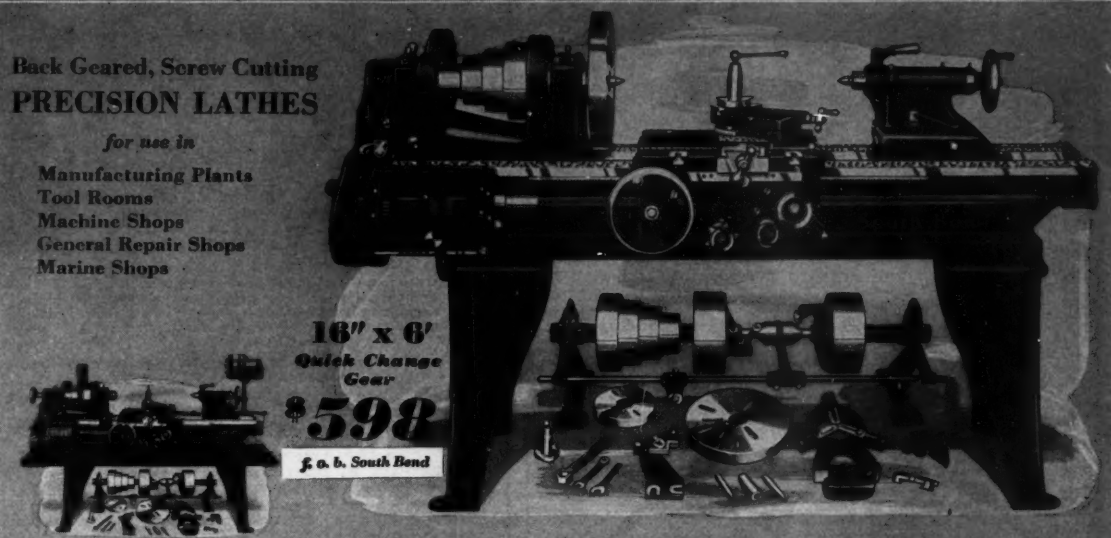

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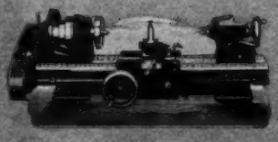

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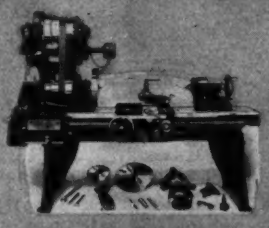

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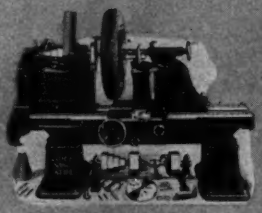

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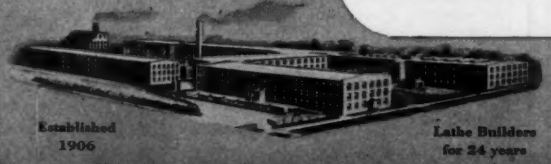

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Lathe Builders for 24 years

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THIS MONTH'S COVER

The picture used for our cover this month shows the work of building trades apprentices, under instruction at the State Trade School at New Britain, Connecticut. They designed and built the house shown.

THE ANNUAL INDEX

The present issue finishes Volume XIX of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION. For this reason the title-page and index are included for those who wish to bind the magazine.

LEST YOU FORGET

This is the last call for the A.V.A. convention to be held at Milwaukee on December 10–13. Make arrangements now to attend if you have not done so before.

Articles Indexed — The articles contained in the Magazine are regularly indexed in "The Reader's Guide to Periodical Literature," and "Education Index."

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Editorial Contributions — The Editor's invite contributions bearing upon Industrial Arts, Vocational Education, Manual Training, and related subjects. Manuscripts, drawings, projects, news, etc., should be sent to the Publication Office in Milwaukee. Contributions are paid for at regular space rates. In all cases manuscripts should be accompanied by full return postage.

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STAR LATHES

In school shops and industrial laboratories — in the small machine shop and on the busy production floor — wherever accurate work of medium size is essential, you will find Seneca Falls Star Lathes.

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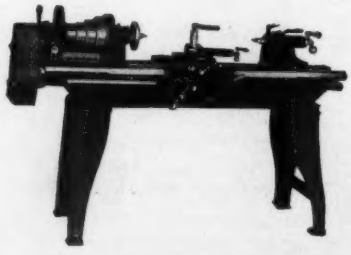

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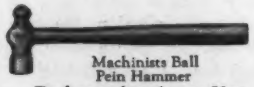
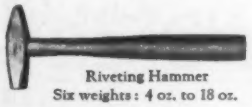


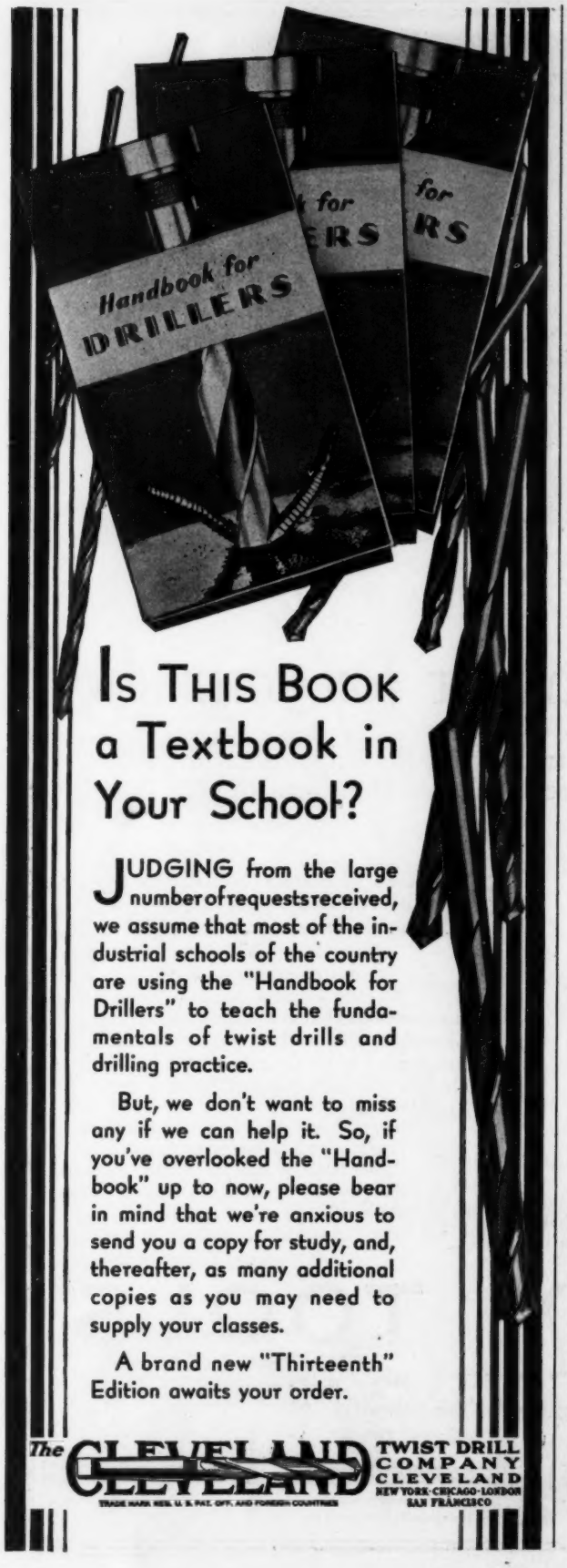
Machinists Ball Pein Hammer
Twelve weights: 4 oz. to 56 oz.

Blacksmiths Hand Hammer
Six weights: 26 oz. to 72 oz.



Riveting Hammer
Six weights: 4 oz. to 18 oz.

Upholsterers Magnetic Tack Hammer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JUDGING from the large number of requests received, we assume that most of the industrial schools of the country are using the "Handbook for Drillers" to teach the fundamentals of twist drills and drilling practice.
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A brand new "Thirteenth" Edition awaits your order.
The CLEVELAND TWIST DRILL COMPANY CLEVELAND NEW YORK CHICAGO LONDON SAN FRANCISCO

(Continued from Page 488)

pointed out that he was opposed to those who would depreciate the work of the manual-arts teacher. He also pointed out that teachers of industrial education are developing culture, based upon a knowledge and appreciation of the finer things in life. Supt. W. W. McConnell, of Winfield, made a few remarks, in which he commented on the better type of teachers to be found in the manual-arts field.

A feature of the program was an original get-together session, in which each man spoke briefly on the subject, "New Things in My Shop."— *Carl G. Brunner.*

Teacher Training at California, Pa.

A fine start has been made in the industrial-arts teacher-training work at the State Teachers' College, California, Pa., under the direction of Mr. S. L. Coover. A total of twenty young men have enrolled in the course to prepare themselves for industrial-arts teachers.

INDUSTRIAL-ARTS ASSOCIATION OF PITTSBURGH HOLDS MEETING

The first meeting of the year of the Industrial-Arts Association of Pittsburgh and vicinity was held in the Connelley Trade School, on Saturday afternoon and evening. Mr. L. H. Turner, principal of the trade school, welcomed the visitors. Mr. F. H. Coyte presided at the afternoon meeting, while Mr. S. L. Coover, of California, told of their new work and outlined the task before them. At the evening session, Mr. J. W. Flemming acted as toastmaster. Mr. F. M. Leavitt, associate superintendent of schools, gave a talk on "Thirty Years of Handcraft Education." He was followed by L. H. Robinson, of the Fisher Body Corporation, who discussed "The Craft Guilds as a Background for a Trade."

At the business session, the association elected the following officers: President, Mr. L. W. Richards; vice-president, Mr. C. W. Thomas; secretary-treasurer, Mr. W. Paul Martin; directors, Mr. Paul Bowers and Mr. C. B. Duff.

Following the election, the visitors were taken through the new trade school. The building is divided into two units and contains accommodations for 1,600 students. The equipment in the machine shop alone cost $90,000, and a number of other shops are equally well equipped. — *George C. Donson.*

SOUTHWEST TEXAS TEACHERS MEET AT SAN ANTONIO, TEX.

The Southwest Texas Industrial Teachers' Association held a meeting in the Main Avenue High School, San Antonio, Tex., during the first week of September. Mr. N. S. Hunsdon, state supervisor, and Prof. E. L. Williams, of the A. and M. College, were the leaders for the group.

MEETING OF THE TULSA MANUAL-ARTS CLUB

The Manual Arts Club of Tulsa, Okla., held its regular meeting in October, with Prof. Arthur B. Mays, of the University of Illinois, as guest of honor. Professor Mays talked on the subject, "Habits To Be Formed in the School Shops," in which he pointed out that habit formation is one of the chief aims of education. He emphasized that there is so much progress due to industrial development, that courses in industrial arts are necessary to properly orientate pupils in an industrial environment. Such courses must not be mere appendages, but must at least equally rank with the other subjects of the curriculum. He classified habit formation under four heads; namely, habits of attitude, habits of procedure, habits of thinking, and habits of manipulative skill, and of these, habits of attitude are the most important. He contended that habits of skill and accuracy should be taught together, because if only one is taught, the counterpart of one or the other will be broken down late. He mentioned that it is necessary to study the laws of habit formation, chief of which are imitation, initiation, and repetition. He concluded his talk by saying that shop teachers have a large responsibility in seeking to initiate and develop these habits.

(Continued on Page 30a)

See How Modern Milling Machines Are Made

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at

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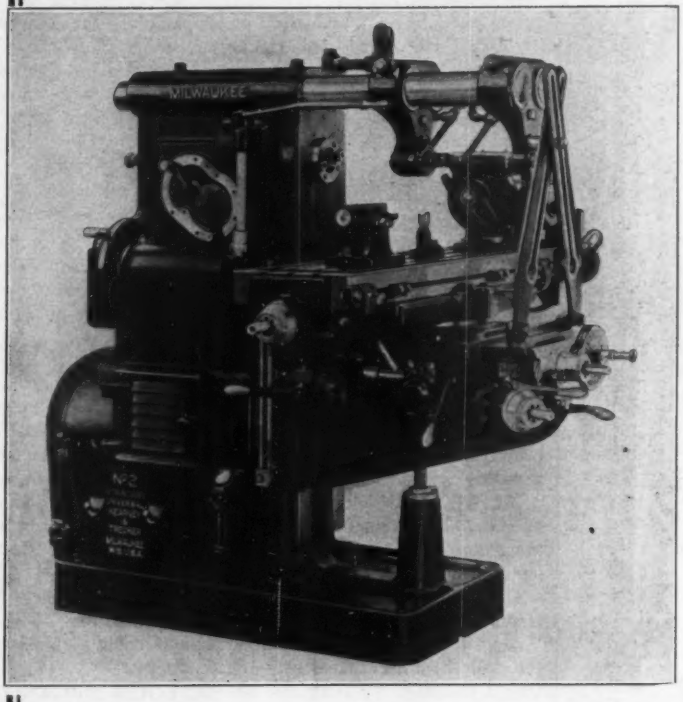

A CORDIAL invitation is extended to all school shop executives and instructors to visit our plant at Sixtieth and National Aves., during your stay in Milwaukee. This is the home of the internationally known Milwaukee Milling Machine, and here you will see the most modern processes in milling machine construction.

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(Please clip and write name and address in margin below)

(Continued from Page 28a)

Other guests of the evening were the associate and assistant superintendents of Tulsa, Prof. C. Wood of the A. and M. College, and several teachers from Bartlesville.—*J. W. Bollinger.*

NEW HAMPSHIRE VOCATIONAL TEACHERS MEET AT CONCORD

The New Hampshire Society for Vocational Education held its annual meeting on October 17 at Concord. Mr. Raymond W. Perry, state supervisor of trade and industrial education of Rhode Island, addressed the association on the subject, "Raw Material."

VOCATIONAL EDUCATION SOCIETY MEETS

The Vocational Education Society of Boston held its first meeting of the school year at the Hotel Westminster, Boston, Mass., on October 25. Forty members were present.

At the meeting reports were read by the secretary, treasurer, president, and chairman of the program committee. An industrial motion-picture film was exhibited, showing in detail the processes in the manufacture of Stetson shoes at the company's plant in Weymouth, Mass. The firm has a number of interesting industrial films, which are available for the use of schools and educational institutions.

The question of holding meetings every two months was taken up. It was decided to submit the question to the members to get an expression of opinion. It was decided to hold the next meeting in December.—*Louis A. Van Ham.*

INDUSTRIAL-ARTS ROUND TABLE OF CHICAGO MEETS

The Industrial-Arts Round Table of the Chicago District, held its first meeting of the year on October 17 at the Central Y.M.C.A. Mr. Wm. C. Brubaker, chairman, presided at the general session attended by 74 men. There were present men from Michigan City, Joliet, Waukegan, and from a dozen or more Indiana cities.

Following the general session, the sectional groups met for discussion. The wood-shop group, drafting, electrical sections, machine shop and the printing section each had an interesting program. The general-shop section determined to list the projects which a boy is to make before specialization is recommended.

Mr. Willis, of the Pullman Free School of Manual Training, offered to send announcements of the Vocational Society to the group. The entire committee will boost the A.V.A. Meeting in Milwaukee.

One of the future meetings of the group will be held at Hammond, Ind., under the direction of Mr. Burrows.

A visit to some large industrial plant is being planned by the committee and members.—*R. B. Bagby.*

VOCATIONAL TEACHERS OF ST. LOUIS ORGANIZE

The vocational teachers of St. Louis, Mo., recently organized and adopted a constitution. They have adopted a program of professional improvement for themselves during the coming year. Mr. Bernard W. Noel, director of instruction in the Hadley Vocational School, is president of the organization.

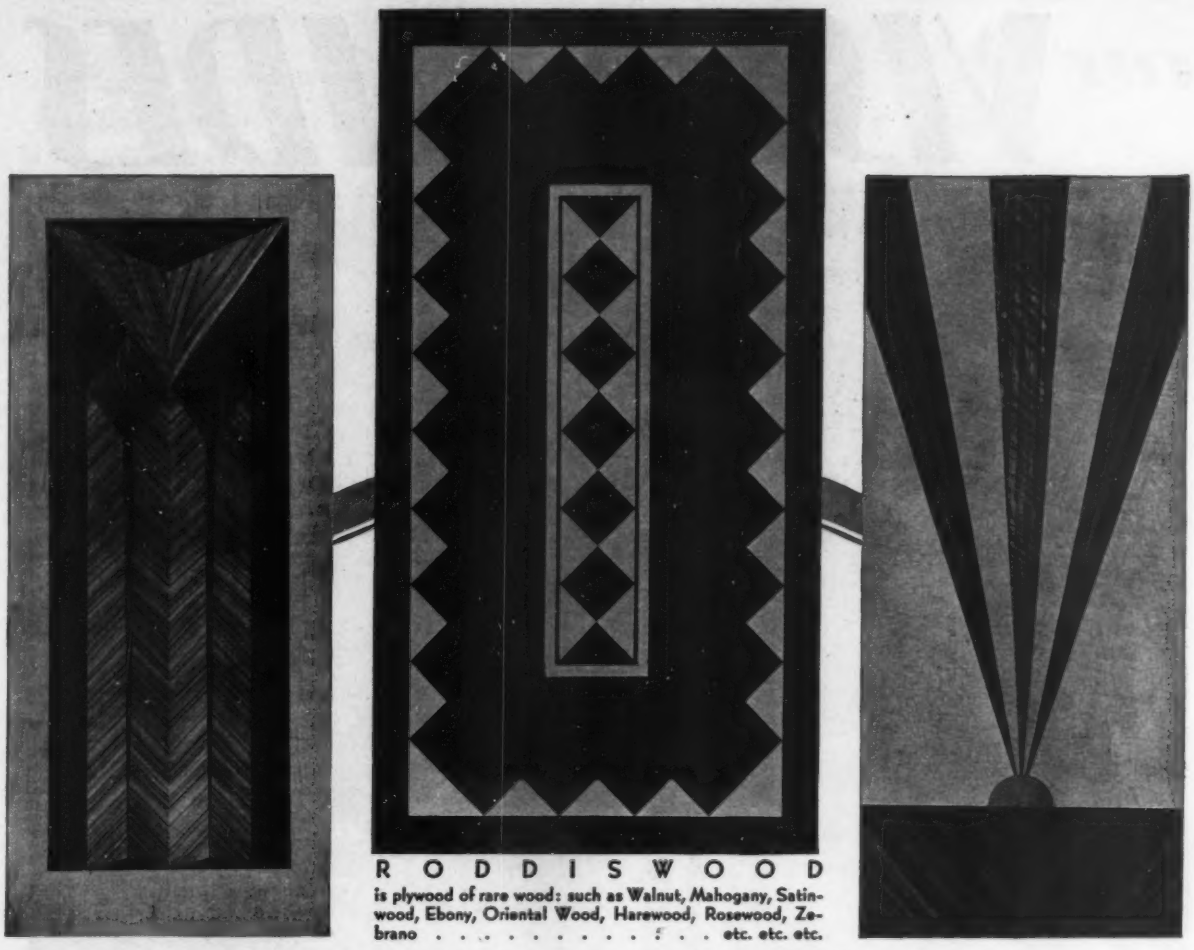
NOVEMBER MEETING OF PEORIA INDUSTRIAL EDUCATION CLUB

The Peoria Industrial Club, consisting of teachers in industrial and vocational work in the Peoria public schools, Bradley Institute, and others interested in industrial education, held its regular monthly meeting on Saturday, November 1. The meeting was held at the Normal University, the sessions being held in the manual-arts building.

At the meeting, Mr. Wilbur Westhoff, of the Central High School, Peoria, gave a talk on his experiments with this phase of woodwork as it was introduced into the freshman classes.

Mr. A. C. Newell, of the Normal University, gave a talk on "How to Meet the Demands for Enlarged Classes," in which he introduced some of the information gleaned from some of the larger school systems.

A number of teachers, as well as students in training, were visitors at the meeting.—*F. E. Hardin.*



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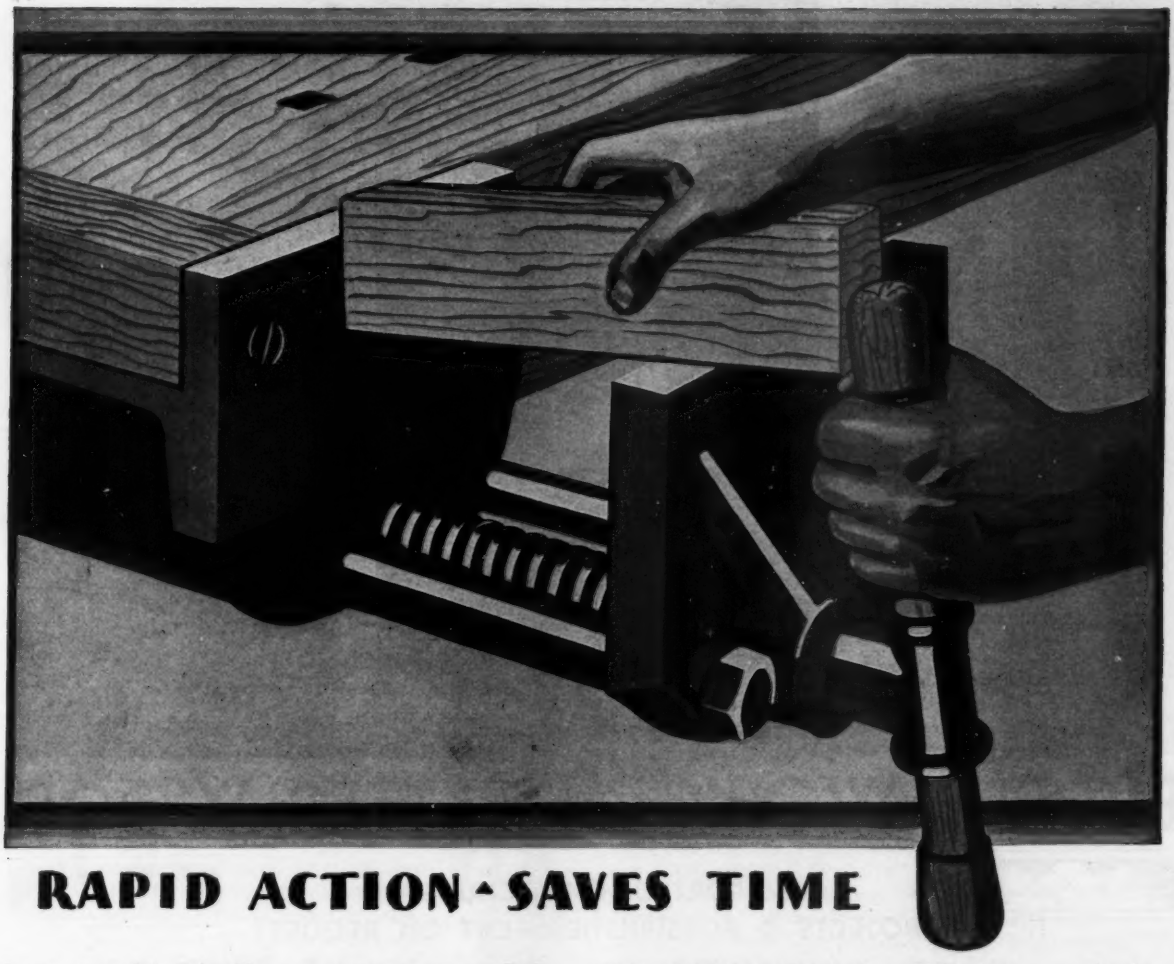

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NEW PUBLICATIONS

Practical Color Harmony

By Lucile Farnsworth. Paper, 29 pages, 9 by 8¾, illustrated. Price 40 cents. Published by the Bruce Publishing Company, Milwaukee, Wis.

This booklet consists of a number of color plates with instructions. The directions which accompany the plates are simple enough for the average pupil of the upper grades and junior high school to understand. By means of this instructional material the pupil will lay a good foundation for the principles of color harmony. The work is arranged in a systematic and interesting way so that much of it can be done without any help from the instructor.

Directed Study Guides for Stevenson's Treasure Island

By Alma Leonhardy and Grace W. Hogoboom. Paper, 69 pages, 8¼ by 11, illustrated. Price 48 cents. Published by The Macmillan Company, New York City.

This booklet is composed of a series of exercises which are to be filled out by the reader as he proceeds with the story. In this way, a close check can be kept on the student, and as a matter of fact, a pupil's progress chart is provided so that the pupil can record the daily grades which he earns by filling out the exercises. This method of guiding the study of a story adds to the interest and assists the student in getting the most out of his reading.

Teaching Problems in Industrial Arts

By Emanuel E. Ericson. Cloth, 433 pages, 5½ by 8⅞, illustrated. Price, $3. Published by The Manual Arts Press, Peoria, Ill.

The author has succeeded in writing a comprehensive book on what the industrial-arts teacher ought to know about his own job. The book is divided into three parts. The first one on Procedure in Teaching Shopwork, discusses what the instructor must do for the pupils in his classes, both before he meets them in class and when the class is in session.

Part II, The What in Teaching Shopwork, covers the aims and objectives of the work, the types of shops in use, subject matter in industrial arts, courses of study, and bases for selecting tools and equipment.

Part III, The Shop Teacher as a Part of the School and the Profession, outlines the extracurricular responsibilities of the teacher, describes how to give publicity to shopwork, outlines the duties of the teacher as a member of a profession, and assists him in deciding the question "Shall I stay in my present position or leave it?"

Industrial-arts teachers will find a wealth of helpful information in this book.

The Fowler Foundry Test

By R. W. Fowler. Form A or Form B with Manual of Directions and Key, $1.25 per package of 50. Published by the Lafayette Printing Co., Lafayette, Ind.

This objective test is of the multiple-choice type. The two forms, A and B, are similar measures of student achievement and may be used alternately in testing. They were devised for students at the college or high-school level. The tests scores were correlated with marks given by instructors, and their reliability is quite high. This test will be found decidedly helpful by teachers of foundry practice.

Fun-Sketching, a Pastime That Pays

By W. R. Maxwell Foster. Cloth, 88 pages, 5¾ by 8¾, illustrated. Price, $1.25. Published by The Macmillan Company, New York City.

(Continued on Page 36a)

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New Orleans, La.			

School Shop Equipment News

For the Supervisor and Teacher who desires to keep abreast with news of new Machinery, Tools, Supplies, etc.

NEW DISSTON CIRCULAR SAW-FILING DEVICE

Henry Disston & Sons, Inc., of Philadelphia, Pa., have announced a circular-saw-filing vise for facilitating the filing of circular saws. The vise is practical, easily handled, strongly built, and adapted to saws from 5 in. to 18 in. in diameter.

Complete information concerning the No. 7 circular-saw-filing vise may be obtained by school-shop instructors on application.

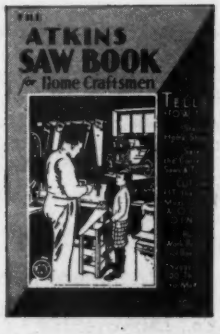
NEW JORGENSEN CLAMP CATALOG

The Adjustable Clamp Co., of Chicago, Ill., has just issued its new Catalog No. 7, describing and illustrating screws and clamps in a variety of designs and for a wide range of activities. The new catalog describes a number of items which are new to the trade, including the pony steel bar clamp and the Holman clamp.

Adjustable and nonadjustable hand screws, steel bar clamps, malleable clamp fixtures, press screws, combination cabinet clamps, carriage clamps, and machinists' clamps also are listed in the catalog.

ATKINS SAW BOOK FOR HOME CRAFTSMEN

E. C. Atkins & Company, of Indianapolis, Ind., has issued a workshop book for the use of the home craftsman or the man pursuing a hobby. The booklet, which contains 31 pages, is devoted to descriptions and illustrations on a variety of



shop subjects. It tells how to start a home shop, how to select and correctly use saws and tools, how to cut and fit the most-used wood joints, how to build a workbench or a tool box, and offers suggestions for a variety of things to make.

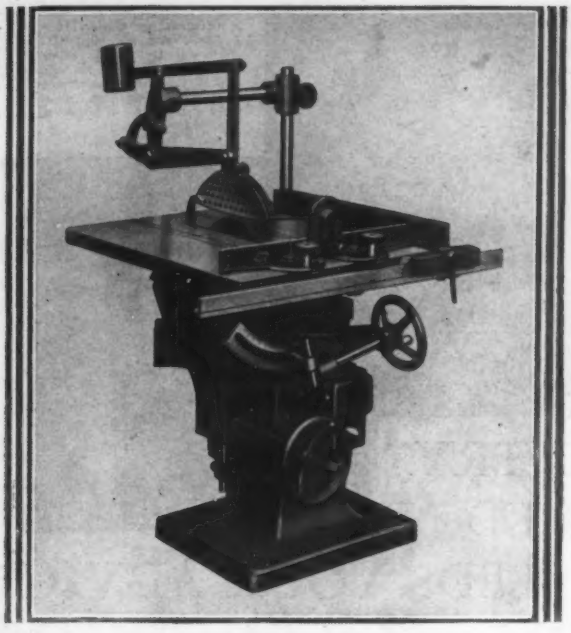
A copy of the booklet will be sent to any school-shop instructor who will write to the Atkins Company at Indianapolis, Ind.

FABER COLORED PENCIL BOOKLET

Painting with Pencils is the title of a new booklet issued by the Eberhard Faber Pencil Company, describing and illustrating the use of the Faber Mongol colored pencils.

(Continued on Page 38a)

QUALITY Wins EVERY RACE!



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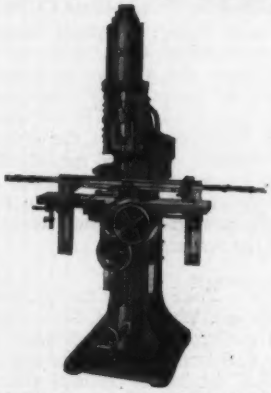
Dec. 10-13



K-25 Direct motor driven hollow chisel mortiser.

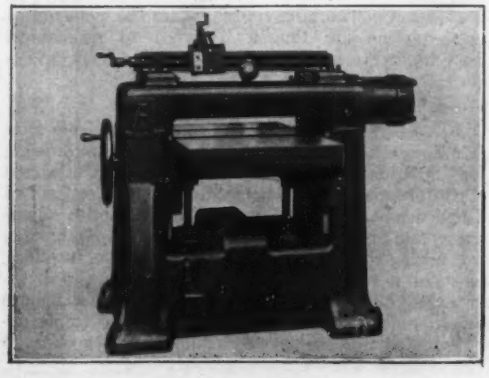
It is Quality that puts the leader against the tape first.

In woodworking also quality wins and in manual training quality is even more essential. Here young minds are being trained for future usefulness. Effects of early training are influential throughout life. Inferior machines can only engender inferior results. Quality tools, whether text books or machines, naturally produce quality results; produce characteristics of accuracy and thoroughness in the student that give him a winning start in any race.

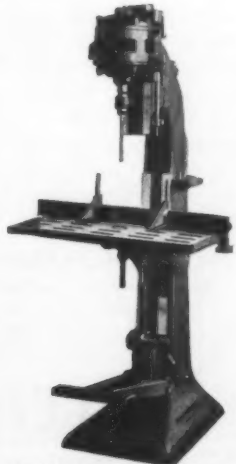
The confidence in which Yates-American woodworking machines are held in every part of the world, not only by school instructors but industrial executives as well, has been built on quality. No school can afford to gamble with the destinies of its students. You are safe with the best that can be procured when you specify Yates-American PROVEN machines.

YATES-AMERICAN MACHINE CO.

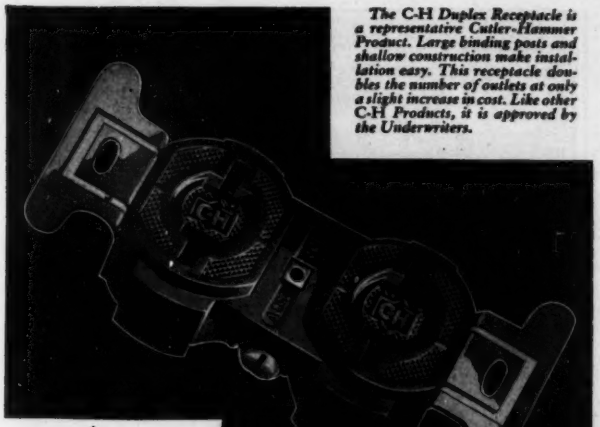
Vocational Machinery
Division
BELOIT, WISCONSIN



At the left the B-4 Single Surfacer. Above the No. 12 Speed Lathe.



The U-21 light duty single borer.



The C-H Duplex Receptacle is a representative Cutler-Hammer Product. Large binding posts and shallow construction make installation easy. This receptacle doubles the number of outlets at only a slight increase in cost. Like other C-H Products, it is approved by the Underwriters.

EVERY STUDENT NEEDS YOUR ADVICE ON GOOD MATERIALS

"TEACH the student the right tool to use and half his lesson is learned."

The old saying is especially true when it comes to selecting the materials you use in electrical work. Good wiring devices must be well constructed and easy to install. Cheap wiring materials, because they do not insure a permanent job of wiring, are not tolerated in actual trade practice where each job is important in gaining and holding customer good will.

Use Cutler-Hammer Wiring Devices in your classrooms. C-H Devices are exceptionally well constructed and their long life, ease of installation, and adaptability have made them the choice of leading electrical men everywhere—the men for whom your students will work. Your advice will be a short cut to practical experience for the students.

C-H Devices are made for every wiring purpose. Order from the complete C-H Line through your electrical wholesaler. He can supply you with all C-H Products. And you will want the two Cutler-Hammer booklets, *"Modern Wiring Necessities"* and *"Safety Switches"*—both of which are sent free on request. Ask for your copies.

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Pioneer Manufacturers of Electrical Apparatus
1323 St. Paul Avenue
MILWAUKEE, WISCONSIN

CUTLER HAMMER
Wiring Devices ··· Safety Switches
(A-405

(Continued from Page 33a)

This entertaining and interesting little book will do much to make the reader try his hand at cartooning. The book is well illustrated.

Woodwork in the Junior High School

By William E. Roberts. Cloth, 248 pages, 5½ by 8, illustrated. Price, 1.75. Published by The Manual Arts Press, Peoria, Ill.

This little booklet will be found helpful by the junior-high-school woodworking teacher. It is well illustrated and contains a great deal of worth-while information. The chapter on art in relation to woodwork is especially to be recommended. The book contains quite a number of detail drawings on different kinds of projects.

You and Your Job

By James J. Davis and John C. Wright. Cloth, 242 pages, 5⅝ by 8¼. Price, $2. Published by John Wiley & Sons, Inc., Brooklyn, New York.

This chatty little book on vocational guidance, written by our United States Secretary of Labor and by the director of the Federal Board for Vocational Education, is quite different from the ordinary vocational-guidance book. It is written by two men who have through personal experience learned what hard work is, and their experiences should be very helpful to the boys and girls who are leaving school to go out into the workaday world.

Seasoning, Handling, and Care of Lumber

Paper, 126 pages. Price, 30 cents. Prepared by the National Committee on Wood Utilization and issued by the U. S. Department of Commerce. The pamphlet is not an instruction manual, but is intended to point out in a suggestive way, the various methods of producing properly seasoned lumber. It takes up the topics of yard layouts, methods of handling lumber, and yard seasoning. There is an appendix containing material on kiln-drying, and a bibliography on the care and handling of lumber.

Graded Shop Problems in Five Units for Special-Class Children

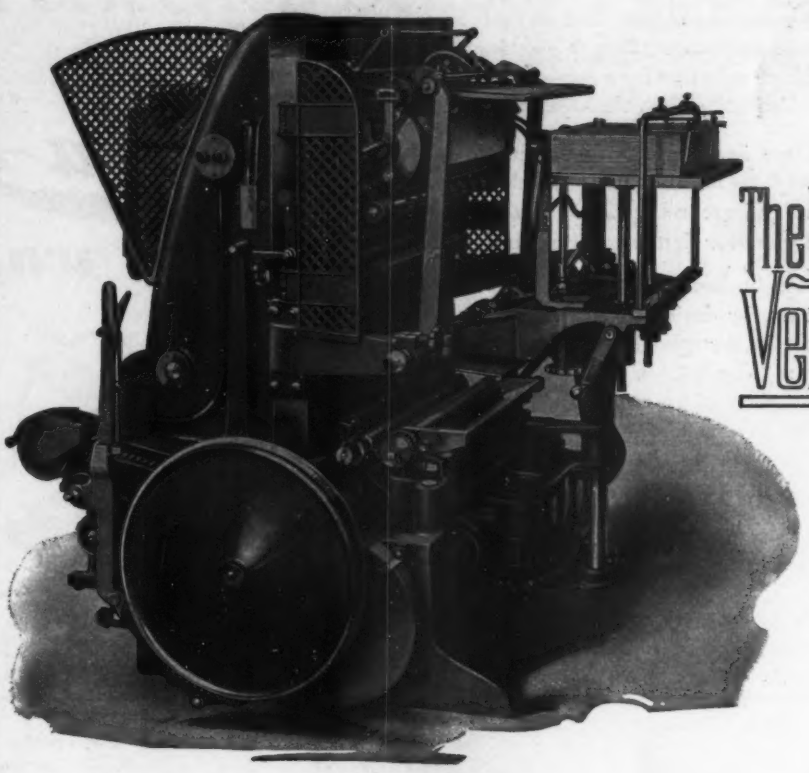
Prepared by Miss Claire Foster. Paper, 109 pages. Issued by the state board of education, Hartford, Conn. A course of study prepared for children below the average in mental ability. The course is the result of several years' experience and observtion in city schools and classes and in the state summer normal school and is intended to meet the educational interests of children of the state who need special educational provisions. The work has been carefully graded so that there is an order of sequence and progression in the problems, and the articles are accompanied by good working drawings and instructions for the teacher.

House Framing Details

Paper, 32 pages. Price, 25 cents. Published by the National Lumber Manufacturers' Association, Washington, D. C. This is a complete revision of an earlier pamphlet published in 1920. It contains complete typical framing plans for typical homes and typical construction details for balloon frame, braced frame, and western frame construction. There are also complete details for framing special features of buildings and for the most widely used types of roofs. The booklet will be found valuable in woodworking classes where the elements of building construction are taught. Teachers of mechanical drawing and architectural drawing will find the book an indispensable reference.

Modern Home Interiors

Paper, 32 pages. Published by the National Lumber Manufacturers' Association, Washington, D. C. This interesting booklet will be found valuable by teachers of architectural drawing, furniture-making, and home decoration. Teachers of free-hand and mechanical drawing will find it a series of numerous interesting problems. The booklet presents six kitchen interiors, a sewing-room interior, two dining-room interiors, two living-room interiors, three bedroom interiors, a bathroom, and several closet interiors. In all cases, the designs are given for both built-in and movable furniture and ample details are provided to enable any skilled woodworker to attempt the construction.



The Miehle Vertical

INSTRUCT your students on machines they will encounter after leaving school. This is a simple rule to follow in connection with printing presses.

Miehle presses are great favorites in commercial print shops and as such their place in the school shop is an important one. The Miehle Vertical combines all the advantages of the most improved type of platen job press with those offered by the cylinder press. It is particularly suitable for school work because of the remarkably short time needed to change jobs. Make-ready is extraordinarily rapid.

The installation of a Miehle Vertical immediately extends the field of school print shop practice to approximate conditions which the student will meet when he enters commercial shops.

Investigate our complete line of printing presses. No obligation.

The Miehle Printing Press and Manufacturing Co.

Fourteenth Street and So. Damen Avenue, Chicago

MARK YOUR TOOLS

UP-TO-DATE shop practice demands that all tools be carefully marked for identification. Proper marking of tools insures quick and accurate selection for a job—prevents costly mistakes—lessens the liability of loss through pilfering.

THE LUMA combines in one compact, handy, portable production tool, weighing less than 20 lbs., an electric pencil for marking hardened and ground steel, a thorough demagnetizer, and a carbon point for light annealing and soldering.

A RECENT editorial in Industrial Arts and Vocational Education shows a very decided trend toward the thorough marking of tools in the school. An excerpt from the editorial is as follows: "The marking may be done in various ways, such as stamping, etching, printing, notching, etc. All of these methods are used, but not every teacher is equipped to do the work so that it does not look more like a disfigurement rather than as a mark of ownership."

The Luma will solve this problem easily and economically. Let us send you a Luma on 5-day free trial.

Luma Electric Equipment Co.
TOLEDO, OHIO

the Luma *way*

3 tools in one
An electric etching pencil
A demagnetizer
An annealing point

View of the Luma marking and demagnetizing in the same operation.

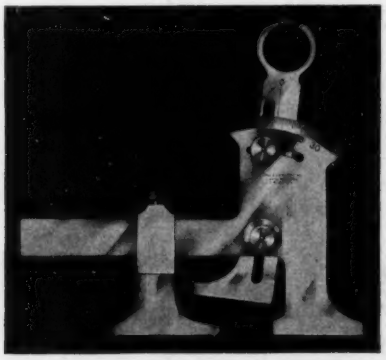
(Continued from Page 34a)

The booklet which contains a number of excellent illustrations, is intended to acquaint teachers, students, and artists with the new technique involved in painting with pencils. Among the illustrations are those showing jewelry designs, interior decoration, animal drawing, textile patterns, floral effects, fashion design, and posters.

Complete information and prices will be sent to any art teacher who will write to the Eberhard Faber Company at 37 Greenpoint Ave., Brooklyn, N. Y.

A CUTTER CLEARANCE GAUGE

The L. S. Starrett Co., Athol, Massachusetts, have just announced a cutter clearance gauge which will determine clearances on all types of miller cutters from ½ to 30 in. in

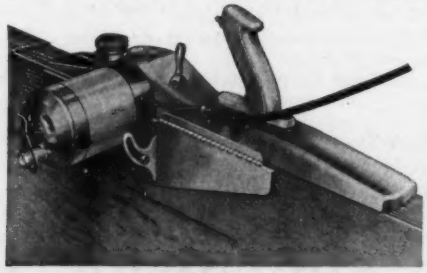


diameter. It is known as the Starrett Cutter Clearance Gauge No. 459 and gives precise readings in degrees. It can be used on end, side, helix, or inserted tooth cutters.

It consists of a tool steel beam fitted with a stationary foot, a sliding foot, and an upright blade which is adjustable both perpendicularly and angularly. The upright blade is graduated to degrees from zero to 30. The reading adjustments are very simple. The perpendicular and angular adjustments of the upright blade are independent of each other. The gauge can be applied without disturbing the cutter, and without removing the cutter from its arbor on the grinding or milling machine.

NEW CARTER SAFETY POWER PLANE

The R. L. Carter Company, of New Britain, Conn., has announced the safety power plane, a new, improved plane for jointer work. The plane is equipped with a long shoe for jointer work, and a safety guard. It is designed for fitting doors, sash,



and similar pieces in much less time than it takes for handwork. The plane is equipped with a spiral cutter for giving a shear cut. This means that it not only cuts easily but leaves a surface which does not require sanding. It cuts equally well with the grain or on the end grain.

A special grinding attachment for resharpening the cutter is supplied, as well as a bracket for holding the plane in position when used as a jointer. The plane is shipped in a metal carrying case which includes all the attachments.

Complete information and prices may be obtained upon application.

The American Perfection School Type Cabinet

Fills the bill for schools desiring the best quality combined with compactness and efficiency of operation

No. 870 (in steel only)

The most up-to-date features of composing room furniture are combined in this cabinet of steel construction in olive green finish, with working bank top sloping both ways, and handy lead and slug rack under both edges of the top. Normal accommodations are provided for four pupils at a time in type setting.

Fronts of the cabinet bodies are reversed, making both sides of the cabinet alike, so that the two pupils working at each side have between them a complete equipment of type, spacing materials and galley dump. There is no superstructure above the top to obscure the instructor's view of his students.

Specifications for No. 870 American School Type Cabinet

No. 870—American School Type Cabinet, steel construction, flush base, with double-tier working-bank top sloping both ways, height to working edge 40½ inches, including two No. 2706 blank cases, two No. 2775 quadruple cases and 34 No. 2735 California job cases (all cases with steel cabinet fronts and No. 6070 combination pulls and label holders), two No. 9178-P quarter-size cases and two No. 12631 detachable galley dumps.

Extras for No. 870 Cabinet

No. 870-BX—Wiring for 2 lights over cases.
No. 870-TX—Wiring for 4 lights over top.
No. 870-E—Locking Devices—(one for each tier) for locking all cases (all keys alike).

For prices and further information, address

EDUCATION DEPARTMENT

American Type Founders Company

300 Communipaw Avenue, Jersey City, N. J.

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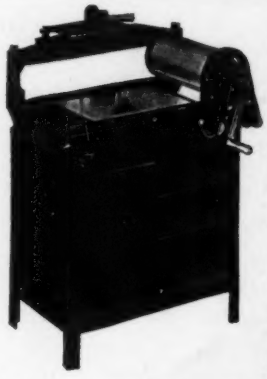
PROOF PRESSES

Rigid Bed

THE VANDERCOOK NO. 1



An efficient, reliable proof press for the school print shop. Unsurpassed in its class for accuracy and dependability. Discriminating school buyers everywhere specify Vandercook because they appreciate the great accuracy of which these presses are capable. The Vandercook No. 1 is an ideal machine for all hand-inking work within its size. It will handle easily all work in the average school print shop. Investigate this machine before ordering your new equipment. It will be worth your while.

Be Sure to Visit Our Exhibit at the A. V. A. Convention in Milwaukee

Vandercook & Sons

Originators of the Modern Proof Press

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Printing Instructors

Simplicity and safety make the Challenge machines and utilities the most practical for students work. Send to us or any printers' supplies dealer for literature on:—

Lee Two-Revolution Cylinder Presses
Diamond Power and Lever Paper Cutters
Advance Lever Paper Cutters
Hoerner Combination Type-High Machine
Sieber Adjustable Hand and Foot Punches
Challenge Proof Presses
McGreal Combination Printers' Chases
Challenge Open-Side Galleys
Challenge Portable Router
Challenge-Howe Page Frames
Challenge Labor-Saving Iron Furniture
Challenge Mammoth Iron Furniture
Challenge Notched Iron Furniture
Challenge Semi-Steel Imposing Surfaces
Challenge Pressed-Steel Galleys
Challenge Rigid-Rim Galleys
Challenge Iron Sectional Blocks and Hooks
Challenge Type-High Gauges
Challenge Quoins and Keys

"The PRINTERS' ALBUM"—the Challenge Magazine—Is Free. Ask for it!

The Challenge Machinery Co.

Grand Haven, Michigan

Chicago, 17-19 E. Austin Ave. New York, 200 Hudson St.

8-30

Complete Equipment for the SCHOOL PRINT SHOP

Wanner School Type Cabinet

Equipping the school print shop is a problem we have dealt with for over 30 years. Various items of equipment are being specially constructed to conform with school shop administration.

We make complete installations of printing machinery, furniture, supplies, outfits, Binding and Folding Box Machinery. Our service department will be glad to give you the most practical layout and a detailed estimate of a printing outfit upon receipt of information about the appropriation, number of students to be taught per class and per day, and the publication forms to be printed.

Send for quotations.

The Wanner Company

716 So. Dearborn St., Chicago, Ill.

TO THE

PRINTING INSTRUCTORS AND FRIENDS

OF THE

AMERICAN VOCATIONAL ASSOCIATION

You are cordially invited to make an inspection tour of our Factory during the Convention

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to teach Art-Fibre Weaving. Our textbook contains all of the fundamentals. Students enthuse over the creation of something artistic and useful. Their interest assures you of success. Hundreds of teachers endorse this service.

VISIT OUR DISPLAY AT MILWAUKEE CONVENTION

TEXT BOOK

164 pages crammed full of interesting points about Art-Fibre Weaving. The language is simple and free from technicalities.

Free With First Order

BOOK of DESIGNS

This book pictures, describes and prices projects which are now being made by students all over the country.

Price 10 cents

Expensive Shop Equipment Unnecessary —

to introduce this interesting subject in your school. All you need is a small hammer, awl and wire cutters. Any ordinary room will do. No soaking or preliminary treatment required.

The use of colored cord enables the student to trim as he weaves. Write for literature.

GRAND RAPIDS FIBRE CORD COMPANY
GRAND RAPIDS, MICH.

NEWS AND NOTES

Hold Fifth Annual Franklin Contest

The United Typothetae of America, Washington, D. C., has announced the fifth annual Franklin Essay Contest, which is open to students of printing in the printing schools and to apprentices in the trade. The subject for the competition is "Franklin's Place in Colonial Printing." The contest will close on December 15 and awards will be made in January, 1931.

New Vocational Schools for New York City

The New York City school authorities have completed plans for an extensive program of vocational schools. More than $18,000,000 worth of vocational- and industrial-school buildings, providing accommodations for nearly 20,000 students, are now under construction, or in various stages of planning.

Largest among the technical schools to be placed under contract is the Brooklyn Technical High School. This school will cost more than $5,500,000 and will provide accommodations for 5,000 students. Next in size among the new schools is the Textile High School in Manhattan, which is to be completed in October, at a cost of more than $2,650,000. The Brooklyn Industrial High School for Girls will be completed during the summer, at a cost of $1,354,000.

Two new vocational schools are provided for in the 1930 school-building program, each to cost in excess of a million dollars, and to provide accommodations for about 1,700 students. Plans are being prepared for the Samuel Gompers Industrial High School for Boys, and for the Bronx Continuation School, both of which will be erected at a cost of more than a million dollars.

Federal Appropriation for Vocational Education

Vocational education in the several states is to be developed under House Bill 10821, introduced by Representative Reed of Dunkirk, N. Y. The bill authorizes an appropriation of $1,000,000 to be made available for the fiscal year ending on June 30, 1931; and each year thereafter for three years, a sum exceeding by $1,000,000 the sum appropriated for the preceding year.

Training Building at Valley City, North Dakota

The contract has been awarded for the erection of the training-school building. The building will include provisions for home economics, manual training, and commercial art.

Group Life Insurance

A group-life-insurance policy has been acquired by Wentworth Institute, Boston, Mass., covering the lives of 52 persons in the institution. The policy is for a total of $52,000. Under its provisions, each person covered receives insurance protection in the amount of $1,000. The insurance is given without cost to the insured, the policy being of the noncontributory type.

Union Workers in New Metal-Work School

Seventy-five apprentice and journeymen members of the sheet-metal members of the local union attended the classes in sheet-metal work sponsored by the union in the Milwaukee Vocational School. An average attendance record of 80 per cent was maintained by the class which met three evenings each week.

New Vocational School at Heflin, Ala.

Construction work has been begun on the Ranburne Vocational High School at Heflin, Ala., which is to be completed at a cost of $15,000.

New Industrial-Arts Shop Building

The Teachers Training Unit of the Western State Teachers College of Kalamazoo, Mich., have just completed the

(Continued on Page 42a)

Storage for boards and instruments

Among the many fine pieces of equipment for the art or mechanical drawing department, made by Kewaunee, is this case for storage of drawing boards and instruments. With a minimum of expense and in a minimum space it accommodates a maximum number of drawing boards and instruments. As many sections as are desired can be accommodated by adding board and drawer units. Cupboard doors over the boards and instrument drawers provide a quick and orderly way of locking up the instruments and boards with the fewest possible number of locks.

Drawing Board and Instrument Storage Case No. L-2073

Write for Kewaunee Book

If you are interested in buying art room equipment, write for the Kewaunee Book. It pictures and illustrates the complete line of Kewaunee Art Room Furniture. The Book is sent without charge to those requesting it on their institution's letterhead.

Art Table No. L-2077

Art Table No. L-2077

This well designed art table provides 6 drawers with locks, for instruments and tools of six students, also compartments for six drawing boards. The top is adjustable and sufficiently large to take care of either junior or senior high school or university work.

Drawing Table No. L-2044

provides individual instrument drawer and drawing compartment for 4 students. Drawer and compartment can be locked with one padlock. Stationary top is 47 inches long and 31½ inches wide.

Drawing Table No. L-2044

Kewaunee Mfg. Co.
LABORATORY FURNITURE EXPERTS
C. G. Campbell, Pres. and Gen. Mgr.
245 LINCOLN ST. KEWAUNEE, WIS.
Designers and Manufacturers of Art and Mechanical Drawing Room Furniture for Schools and Colleges
Factories at Kewaunee, Wis., and Adrian, Mich.

(Continued from Page 41a)

construction of a new 50 by 80 ft. industrial-arts shop building. The building is a separate unit and is of the general-shop type. Carl v. Lindeman is the instructor in charge of the critic work.

Offer Course in Interior Decoration

A course in practical interior decoration is being conducted by Mr. I. I. Gotliffe at the Manhattan Evening Trade School, Manhattan, New York. In the course, new phases of interior decoration will be studied. Competitions among the students also will be conducted.

New Shop Building at River Falls, Wisconsin

The State Normal School at River Falls, Wis., is planning the erection of a shop building at a cost of $22,000.

Sheet-Metal Work at Cincinnati, Ohio

The apprentice committee of the sheet-metal contractors' association, working in coöperation with the department of vocational education at Cincinnati, Ohio, has reopened the class for sheet-metal apprentices which had previously been discontinued because of a lack of teachers and suitable accommodations. Two classes will be conducted, one for experienced workers, and the other for those who have been in the trade only a short time. The classes are conducted under the Smith-Hughes Law, with the supervision in charge of the board of education.

New Vocational School at South Milwaukee, Wisconsin

The contract was recently awarded for the erection of a vocational school at South Milwaukee, Wis., at a cost of $80,000.

Instruction in Retail Selling Advocated for Public Schools

A study of commercial occupational trends has disclosed a need for retail selling classes in the public schools, according to a recent statement of Mr. E. W. Barnhart, chief of the commercial-education division of the Federal Board for Vocational Education.

In his study, Mr. Barnhart found that in 1928, there were 241 high schools offering courses in salesmanship to 4,983 boys and 4,989 girls, or a total of 9,972 students. The increase in enrollment during the six-year period, he said, has been 77 per cent. Of the 241 high schools offering such courses, the actual number of trained teachers will not exceed 75 in the entire country.

The study also revealed that there is only one school in the country which trains boys for retail-store managers, and that is at Omaha, where a technical high school has a remarkable program. The need for more retail salesmanship courses has become apparent, since there are more graduates of high schools entering retail selling than shorthand or bookkeeping jobs, and the conclusion is that there are more people engaged in selling jobs than there are in the secretarial types.

Trade Schools for the District of Columbia

A movement for securing two trade schools for the District of Columbia has recently received strong support. One of these schools would be for white children, and the other for colored, with admission open only to children who had completed the eight grades. The course in the trade schools would cover two years in all trades, with the exception of electrical work, which would require three years to complete. Approximately 30 trades would be taught.

The work will be handled by a citizens' advisory committee, which is composed of representatives of the trades, the civic associations, and the schools. The plan contemplates making the district eligible to receive a portion of the Smith-Hughes Vocational Fund. In the past this money has not been available to the District. To be eligible to re-

(Continued on Page 44a)

Why are

DIETZGEN INSTRUMENTS

the accepted standard in thousands of schools

A Typical Repair Kit

**For each grade of Dietzgen instruments there is a repair kit. Each kit will keep 50 sets in perfect condition.*

One of these repair kits in a classroom which has standardized on a certain grade of DIETZGEN Drawing Instruments makes it possible to keep the drawing instruments of an entire class in first class working condition at all times.

Because . . .

they are accurate
- are durable
- are milled from bars—*not stamped out*
- are made of cold rolled nickel silver

Joints are rust-proof and accurately fitted

Parts are interchangeable

Each process of manufacture is carefully supervised

There is a repair kit for each grade of Dietzgen instruments.*

The instructor who standardizes on Dietzgen instruments helps both student and himself, for good tools are a recognized necessity in the mechanical drawing room.

Write for Special School Catalog No. 30A

See you at Booth No. 18 at the American Vocational Association Convention at Milwaukee, December 10

Standardize on Dietzgen Standardized Instruments

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Enduring worth at reasonable cost

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An interesting display of—

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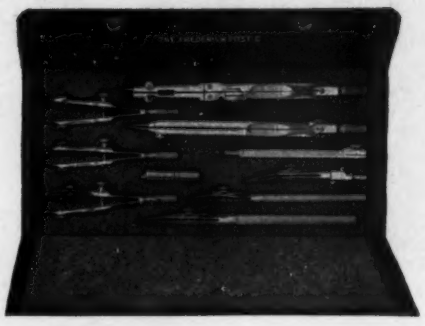
DRAWING INSTRUMENTS AND SUPPLIES



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THE FREDERICK POST CO.

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(Continued from Page 42a)

ceive any part of the money, there must be allotted from state or other funds, an amount at least equal to the federal allotment. If the district should become eligible to receive a portion of the money, the amount received would reach $40,000 annually. Congress would be compelled to appropriate an additional amount in the regular budget to balance this, or provide the entire amount for the proposed trade schools.

Vocational-Guidance Course at Nyack, N. Y.

The school board of Nyack, N. Y., has introduced a course in vocational guidance in the last two years of the junior high school. The course is one of several being conducted in the state and will be taught similar to a civics course. It is open to students who complete their eighth-grade history course in January during the second term of the year.

Vocational Course at Newkerk, Oklahoma

A Smith-Hughes agricultural course has been introduced in the high school at Newkerk, Okla. The course is intended for boys who desire to return to the farm after leaving school. Instruction is given in scientific farming, including all phases of agricultural activities.

Walnut Preferred for Furniture

More than half of the housewives of the country prefer furniture made of walnut, according to a survey recently completed by the American Walnut Manufacturers' Association, to determine preference trends in furniture woods and styles. Forty-five per cent of those interviewed, who did not own walnut furniture, expressed their preference for that wood, and indicated that their future purchases in furniture would be walnut.

The survey brought out other interesting factors on style. Colonial furniture was the favorite with more than 28 per cent of those asked to give their choice. Only one and one half of one per cent were attracted to the modern style. It was significant that walnut is definitely associated with early American or Colonial styles in furniture. This was indicated by the fact that 45 per cent of those expressing a preference for Colonial furniture, wanted furniture of that style to be of walnut.

Fisher Body Craftsman's Guild

The Fisher Body Corporation, of Detroit, Mich., has organized a craftsman's guild to stimulate and develop craftsmanship among boys of high-school age in the country. The guild is offering four university scholarships of four years each, and 960 other awards having a total value of $50,000 are offered to boys of high-school age for proficiency in craftsmanship.

The purpose of the guild is to perpetuate the ideals and principles of craftsmanship as founded and developed by the craft guilds of the Middle Ages. For its first problem in craftsmanship, the guild has chosen the building of a miniature model Napoleonic coach, and the awards will go to boys between the ages of 12 and 19 years who display the finest craftsmanship in building these models. Up to the present time, several thousand boys in the country have enrolled in the guild.

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The Playground and Recreation Association of America has recently issued a small pamphlet, entitled "Home-made Play Apparatus," as an aid in the construction of home playground apparatus. The pamphlet offers drawings, with specifications and construction notes, for the erection of standard playground apparatus which may be built by shop students.

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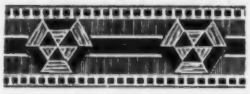

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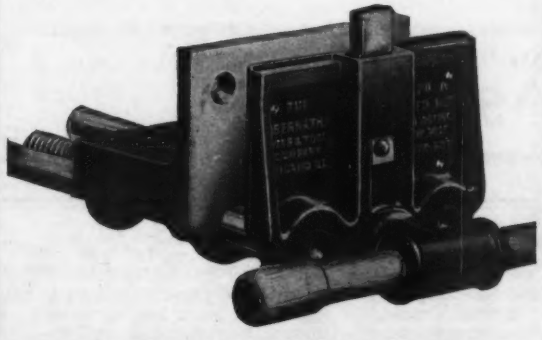

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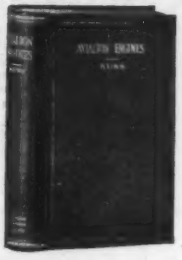

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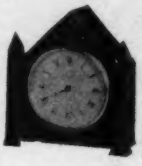

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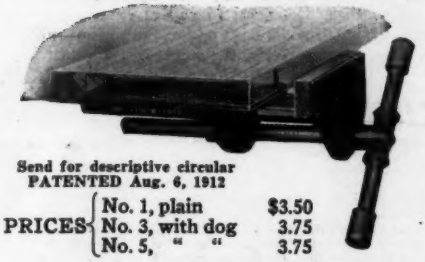

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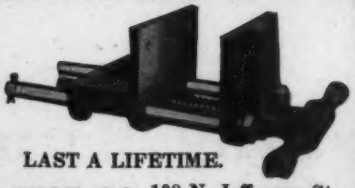

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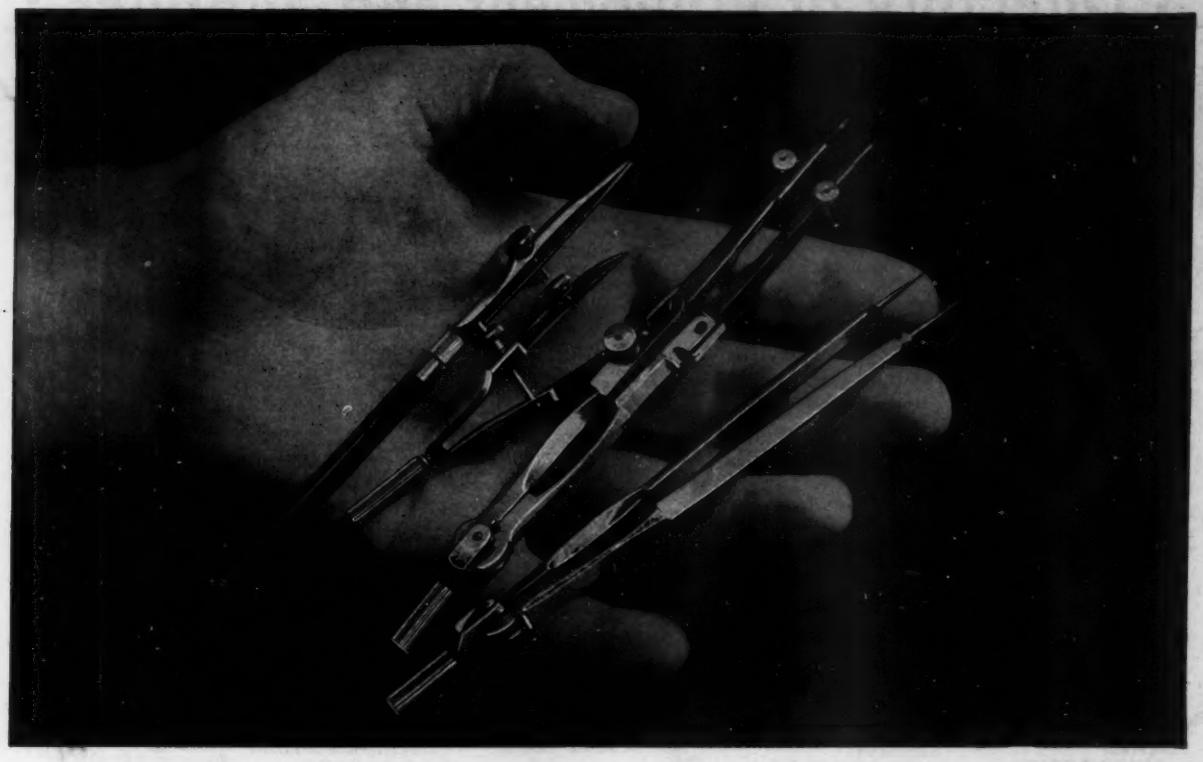

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